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NOMAD TRAIL ARCHAEOLOGICAL PROJECT
IN EDDY COUNTY, NEW MEXICO
PROJECT NUMBER YA-512-CT6-268

Patrick H. Beckett
Mark C. Strong
Susan M. Strong

A REPORT PREPARED FOR THE BUREAU OF LAND MANAGEMENT under the direction of Dr. Stanley D. Bussey of the Cultural Resources Management Division, Department of Sociology and Anthropology, New Mexico State University, Las Cruces, New Mexico. Work was carried out under BLM Permit 75-NM-003.

January 1977

Report No. 64

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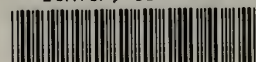
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ABSTRACT

The Cultural Resources Management Division of the Department of Sociology and Anthropology, New Mexico State University, conducted an archaeological collection and excavation of two small lithic scatters and an intensive survey of 1.7 miles of the Nomad ORV Trail. Both of the sites and the trail were located on Bureau of Land Management administered lands in southeastern New Mexico.

ACKNOWLEDGEMENTS

The Nomad Trail Archaeological Project conducted by New Mexico State University would not have been possible without the cooperation of a number of individuals and organizations. The Cultural Resources Management Division, Department of Sociology and Anthropology, New Mexico State University, wishes to thank these individuals and organizations for their cooperation.

The Contracting Officer's Authorized Representative (COAR) for the Nomad Trail Archaeological Project was Charles B. Godfrey, Outdoor Recreation Planner, Roswell District Office, who has provided the project with information and advice when needed.

Ms. Ann Ramage, Roswell District Archaeologist, made several trips to the excavation areas, with needed maps and helpful advice.

Dedie Snow, Museum of New Mexico, has as always provided information and LA numbers when needed.

Mr. Robert H. Leslie, Lea County Archaeological Society, has provided the senior author with personal observations on the archaeology of southeastern New Mexico.

Doctors Richard W. Spellenberg and William A. Dick-Peddie, Department of Biology, New Mexico State University, have graciously given their time and expertise when called upon. Their help has been deeply appreciated.

Dr. Betty Lee Brandau, Geochronology Laboratory, University of Georgia, had the carbon sample promptly processed upon receipt.

Mr. Norman J. Hall and Mr. John Womack Jr., Instructional Development Center, New Mexico State University, provided the processing of the archaeological photos, within a tight time frame.

Dr. Russell E. Clemons, Department of Earth Science, New Mexico State University, provided some of the identification on the raw lithic material collected.

The Library Staff at New Mexico State University has been most helpful in chasing down obscure bibliographic leads, and in obtaining the needed material on interlibrary loan when it has not been available locally. To single out individuals when so many have helped would do injustice to the rest of the staff.

As with all projects, no work would get done without the help of their secretarial staff. The following have graciously given their efforts when called upon: Charlotte C. Chavez, Evangeline C. Andrews and Norma I. Silva. In addition, Russell W. Baker, student assistant, helped considerably by typing some of the artifact forms.

The authors especially want to thank the following crew members for their hard work, during a rather cold and wet two weeks: Russell S. Bamert, Barney T. Burns, Mary Jane Butfigieg-Berman, Laurel H. Cockerham, and L. Jean Hooton.

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INTRODUCTION

The Bureau of Land Management, Roswell District, conducted an intensive archaeological survey of the proposed Nomad Off-Road Vehicle Trail system beginning in March 1975 and ending in July 1975, under the direction of Ann Loose, District Archaeologist.

Two sites were encountered, NTS-8 (LA 14809, The Dillahunty Site) and NTS-12 (LA 14810, The Yeso Hills Site). Because these sites were endangered by use of the Nomad ORV Trail, the Bureau of Land Management decided to mitigate the affects of impact by collection and excavation in compliance with the Antiquities Act of 1906, National Historic Preservation Act of 1966, National Environmental Policy Act of 1969, and Executive Order 11593 of 1971

The Bureau of Land Management contracted with New Mexico State University to perform the collection and excavation.

From October 11, 1976 through October 22, 1976, Russell S. Bamert, Barney T. Burns, Mary Jane Buttigieg-Berman, Laurel H. Cockerham, L. Jean Hooton, Mark C. Strong and Susan M. Strong, under the field supervision of Patrick H. Beckett of the Cultural Resources Management Division, Department of Sociology and Anthropology, New Mexico State University, conducted an archaeological collection and excavation of these two lithic scatters southeast of Whites City, New Mexico. The project was under the direction of Dr. Stanley D. Bussey.

Because it had been decided to reroute 1.7 miles of the proposed Nomad Trail, the archaeological clearance survey for the 1.7 miles of the Nomad ORV Trail was included in the contract between New Mexico State University and the Bureau of Land Management.



FIGURE 1: PROJECT LOCATION



Work was carried out by contract between the Bureau of Land Management, United States Department of the Interior and the Regents of New Mexico State University under Order Number YA-512-CT6-268.

Geology

The topography of the area is dominated by the Guadalupe Mountains and by El Capitan which is located approximately 25 miles to the southwest of the Yeso Hills Site. This topography was formed by a general uplift of the Capitan Reef from sedimentary beds laid down during Permian times. The faulting responsible for the formation of the Guadalupe mountains occurred late in the Pliocene or in the Pleistocene (King 1948:157). This uplifting caused the rejuvenation of stream action, which resulted in increased erosion of the local topography, and the headward movement of the developing Pecos River.

The Ogallala Formation that overlies the Llano Estacado and is found in the Yeso Hills area (Bretz and Hornberg 1949:484) was deposited during the Miocene and Pliocene; generally most is thought to be Pliocene in age (Darton 1928:58). It is from the Ogallala Formation that the chert, quartz and silicious cobbles are weathering out. These quartzose cobbles were being sought out and utilized by the aboriginal inhabitants of the area.

The terrain at the Yeso Hills Site is a typical karst topography. The percolation of the ground water has carried vast amounts of gypsum in soluble form toward the Pecos River basin. As the soluble materials dissolve, underground caverns are formed and when the caverns collapse, new sinkholes are formed.

The soils of the Yeso Hills Site fall into the Gypsum land-Cottonwood Complex. This complex consists of barren, gypsiferous rocks and very shallow soils (Chugg et. al. 1971:22). Where soil occurs, it is part of the Cottonwood series. Soils of the Cottonwood series typically have a surface layer of light-gray to light brownish-gray loam (Chugg et. al. 1971:20).

The area to the south and southwest of the site has four sinkholes in the gypsum beds that drain the surface runoff after rainfalls. The areas around the sinkholes have an abundance of cobbles that have eroded out of the dissolved gypsum. Some of these show primary and secondary flaking.

SUMMARY OF CLIMATIC CONDITIONS OF THE PECOS VALLEY AREA
IN SOUTHEASTERN NEW MEXICO

In his summary, Tuan states that climate is "...expression of temperature, precipitation, wind, cloudiness, etc...as they occur together during the longer passage of time. In short, climate is our experience, through time, of weather (Tuan et. al. 1969:157)."

Under the heading of general characteristics Tuan says, "The climate of New Mexico is moderate in terms of temperature and arid to semiarid with respect to moisture (Tuan et. al. 1969:157)." Although this is a broad statement in terms of the entire state, it is an apt though laconic description of climatic conditions for the region of the Pecos Valley running through the southeastern corner of the state.

The controlling factors that result in climatic differences from one area to another are (a) latitude, (b) location with regard to moisture-laden winds, and (c) differences in elevation (Tuan et. al. 1969:159-160).

The project area, located south of Whites City, New Mexico is near Latitude 32° North and is situated at an altitude almost 2,000 feet below the average elevation for the state which is about 5,700 feet above sea level. The principal sources of moisture for precipitation are the Pacific Ocean, 500 miles to the west, and the Gulf of Mexico, 500 miles to the southeast (Houghton 1974:794).

The meteorologic data presented in figures 3 to 8 was compiled for the area of the Pecos Valley bordering the eastern plains on the west and extending 160 miles in a north to south orientation from Roswell, New Mexico, at the northern extent, to Pecos, Texas the southern limit.

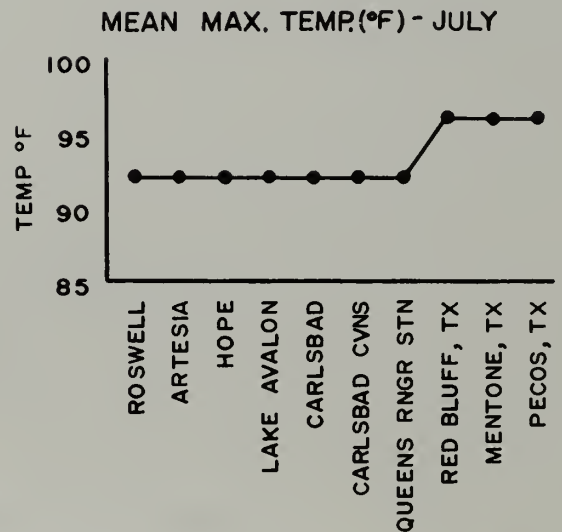
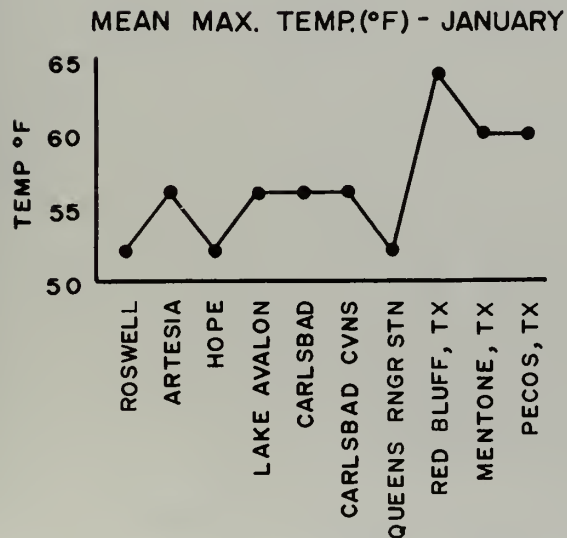
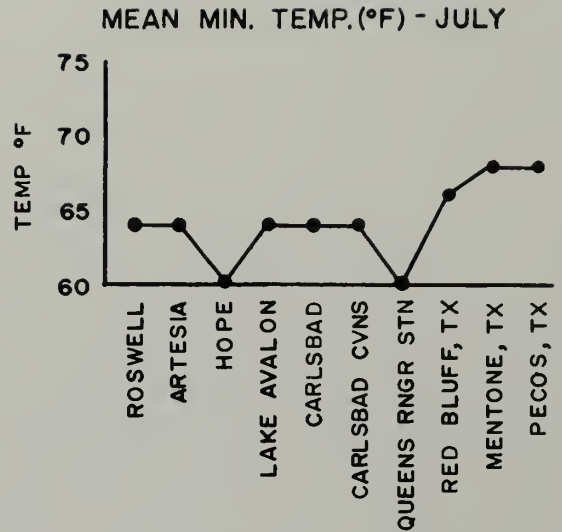
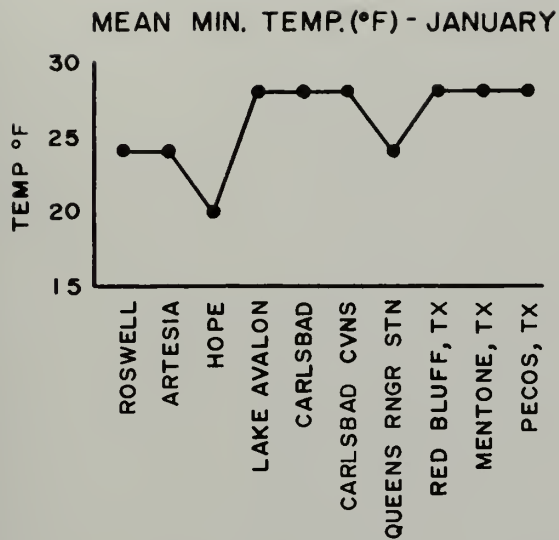


Figure 3 : MEAN MINIMUM/MAXIMUM TEMPERATURE - JANUARY/JULY 1931-1952
 COMPILED FROM HOUGHTON 1974:805-808; ORTON 1974:916-919.

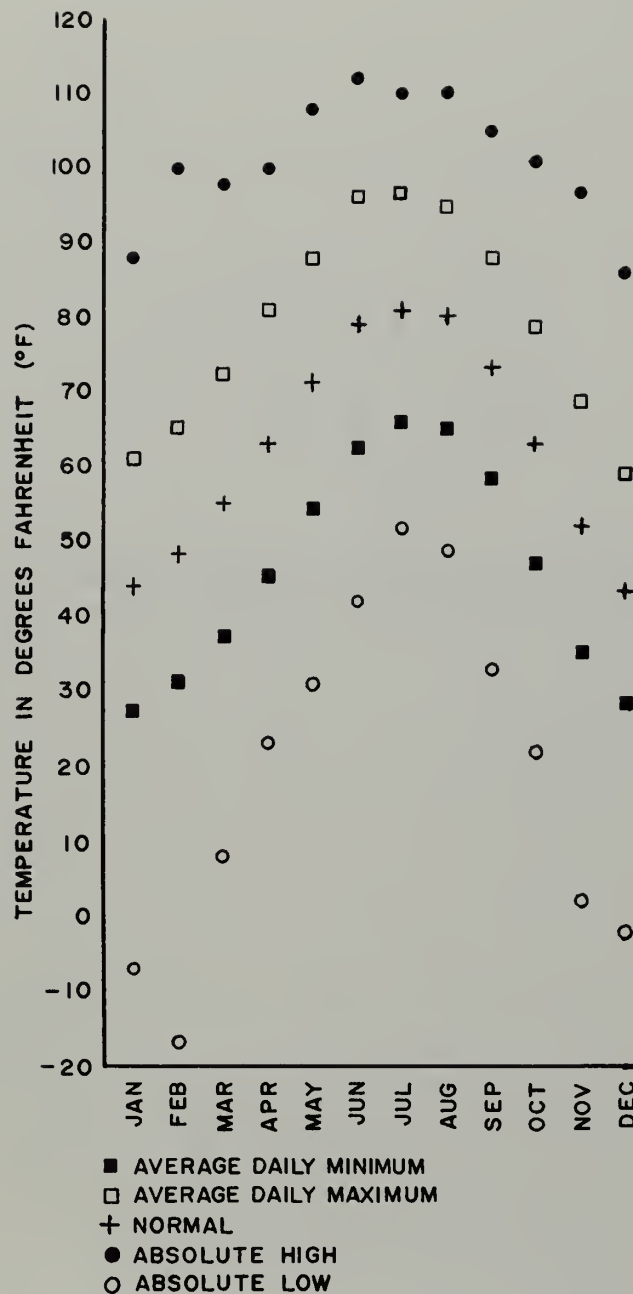


Figure 4 : AVERAGE TEMPERATURE (°F) BY MONTH
CARLSBAD 1895 - 1946
COMPILED FROM LONG 1946:2.

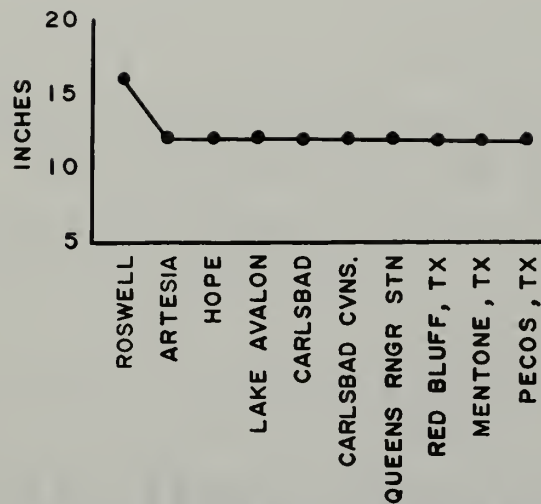


Figure 5 : MEAN ANNUAL PRECIPITATION 1931-1955
COMPILED FROM HOUGHTON 1974:809; ORTON 1974:888.

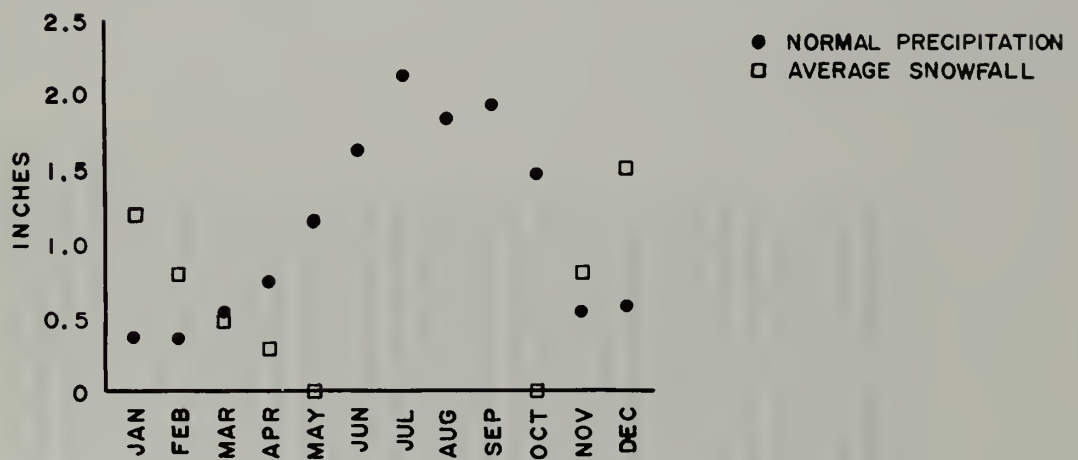


Figure 6 : AVERAGE MONTHLY PRECIPITATION
CARLSBAD 1896-1946
COMPILED FROM LONG 1946:2.

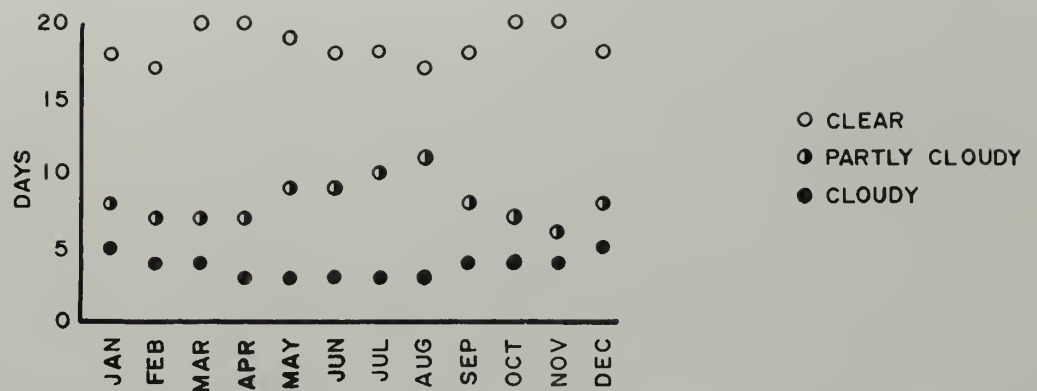


Figure 7: CLOUD COVER AVERAGE BY MONTH - CARLSBAD 1895 - 1946
COMPILED FROM LONG 1946:2.



Figure 8: DURATION OF SEASON WITHOUT KILLING FROST
TAKEN FROM YI-FU TUAN et al 1969:84.

Carlsbad, New Mexico is located in the approximate center of this designated area. The number of years of data recording and collection varies from 20 to over 50 years depending on the type and location of the recording station.

The mean annual temperature in southeast New Mexico is 64° (Fahrenheit), though during the summer, daytime temperatures often surpass 100° at elevations below 5,000 feet (Houghton 1974:795). Because the dry, clear air permits both rapid gain and rapid loss of heat, summer days may be particularly hot and summer nights pleasantly cool (Tuan et. al. 1969:157), with the average range between daily high and low temperatures being from 25° to 30° (Houghton 1974:796). The average minimum January temperature for the designated area of the Pecos Valley is 26° with the average July maximum a little over 93° (Figure 3). A more detailed presentation of temperature ranges and variations for the Carlsbad area can be found in Figure 4. The duration of the frost free season for the Carlsbad region averages 200 days, as illustrated by Figure 8.

The average annual precipitation is around 12 inches (Figure 5). "A wide variation in annual totals is characteristic of arid and semiarid climates as illustrated by annual extremes of 2.95 and 33.94 inches of precipitation at Carlsbad during a period of record of more than 71 years (Houghton 1974:795)." During the warmest 6 months of the year, May through October, precipitation averages 80 percent of the annual total in the eastern plains, (Figure 6) with winter being the driest season in New Mexico (Houghton 1974:795).

The duration of sunshine is fairly even throughout the year in New Mexico with from 75 to 80 percent of the sunshine being received (Houghton 1974:796). A graph of the average number of clear to cloudy days by month for the Carlsbad vicinity over a 51 year recording period is presented in Figure 7.

"Wind speeds are generally moderate over the state, tending to be stronger in the eastern plains and predominating from the southeast in summer and from the west in winter (Houghton 1974:796)."

FLORA AND FAUNA

Introduction

Vegetation can be one of the most Important Indicators of environment. The variety, number, and types of vegetation is determined by the geography, geology and climate; then, from the flora, the base for the fauna of the area is to be found. Along with elevation and climate, vegetation is used to define life zones and along with fauna, eco-systems. There has even been some consideration of completely redefining life zones in terms of vegetation.

Kroeber realized the importance of vegetation in his study of the coincidence of natural and cultural areas in North America.

"Of the various geographical and environmental classifications which might be compared with the native cultural classification, those dealing with vegetation perhaps prove on the whole the most useful. This is expectable, since culture, through houses and fire, enables even the most backward peoples to work out a residence adjustment in most any climate or terrain, but does not make possible nearly so decisive a control, even through agriculture, of the general vegetation on which, directly or indirectly, most subsistence is based (Kroeber 1939:13).

Included in this work are several of the earlier maps of vegetation areas of North America with variable approaches towards the definitions of these areas.

Life Zones

Since the idea of characterizing life zones according to vegetation has not yet been fully developed, the transcontinental life zones defined by Bailey (1913;1928) for New Mexico will be used in this discussion of

environment. However, two recent maps of vegetation areas are worth noting here. One is a map of vegetation areas of the United States (Kuchler 1964), which classifies the region in which the archaeological sites are located as part of the Trans-Pecos Scrub Savanna. A second map, entitled "Primeval Vegetation Types of New Mexico" (Gross 1976), calls this region Grassland Savanna, and also shows the dominant genera of plants in each area.

Basehart, in his study of subsistence patterns of the Mescalero Apache, has divided the natural regions of his research area into four classes characterized by associations of flora and fauna. Although not as extensively defined, these classifications roughly correspond to the four life zones given for this part of New Mexico by Bailey (1913; 1928). The regions categorized by Basehart are: (1) semi-desert brush, (2) grassland, (3) woodland, and (4) forest (Basehart 1974:7-9).

With regard to life zones, the location of the research area is somewhat unique in the variety of nearby environments. Located in the semi-arid desert grasslands, consisting of both the Upper and Lower Sonoran zones, the immediate area surrounding the sites contains varied plant and animal life. Also within easy access from the sites are the Transition zone and the Canadian zone, adding to the richness of plant and animal life available.

The Lower Sonoran Zone

The Lower Sonoran (Austral) zone in this area of the state begins at the Pecos River bottom and covers the valley and low plains up to an altitude of about 5,000 feet on south slopes and to about 4,000 feet on the cooler north slopes.

The Lower Sonoran, the zone of mesquite and creosote bush, is characterized by the following shrubs: creosote bush, mesquite, catclaw, ocotilla, all-thorn (cruxifixion thorn), blue-thorn, desert willow, three-leaved barberry, sumacs, Mexican buckeye, varnished bush, sotol, and yucca (Bailey 1928:11). Many forbs, as well as numerous species of cacti and grasses are also found in this zone.

Some of the native animals characteristic of the Lower Sonoran area are the jackrabbit, desert cottontail, Rio Grande striped ground squirrel, cave mouse, gray wood rat, cotton rat, large and small kangaroo rats, pocket mice, pocket gopher, opossum, several types of skunks and bats; birds including the roadrunner, cactus woodpecker, nighthawk, cactus wren, and mocking bird. The Texas diamond rattlesnake and various lizards are the most common reptiles (Bailey 1928: 11-12).

The Upper Sonoran Zone

The Upper Sonoran (Austral) zone in this region covers most of the plains and the foothill regions of the Guadalupe and Sacramento mountains, extending up to 7,000 to 8,000 feet according to slope exposure.

This zone, characterized by nut pine and juniper, contains species of scrubby junipers, nut pine, gray and Vasey shrubby oaks, mountain mahogany, mulberry, hackberry, Apache plume, catsclaw, skunkbush, service berry, star leaf, silk tassel bush, syringa bush, manzanita, many species of rabbit bush, yucca, and century plant (Bailey 1928:16). Forbs and grasses are also numerous in the Upper Sonoran.

The Texas mountain sheep, gray mule deer, peccary, rock squirrel, Rowley white-footed mouse, white-throated wood rat, gray fox and bobcat are found in this zone along with quail, jays, sparrows. Reptiles are less abundant than in the Lower Sonoran zone (Bailey 1928:16).

The Transition Zone

Generally running from 7,000 to 8,500 feet on northeast slopes and from 8,000 to 9,500 feet on southwest slopes, the Transition zone covers a limited area along the top of the Guadalupe Mountains and a larger area of the Sacramento. The nearest area of the Transition zone to the sites is approximately eight miles to the southwest along the highest peaks of the Guadalupe in Texas.

This zone is strongly marked by western yellow pine, with Douglas spruce, southern white pine, large-leaved maple, New Mexico oak, and locust occupying secondary places in the forest (Bailey 1928:17). Various species of grasses make up the greater part of the forest floor and open meadows, along with the forbs found in this zone.

White-tailed and mule deer, black and grizzly bear, chipmunks, ground squirrels, wood rat, meadow mice, gopher, cottontail, and the brown bat inhabit the Transition zone. Wild turkey, pigeon, various species of owls and woodpeckers, hummingbirds, nuthatches, robins, bluebirds, and warblers are some of the many birds found here (Bailey 1928:17-18). In this zone, reptiles are scarce and not commonly seen.

The Canadian Zone

The Canadian zone, consisting of the highest mountain tops in this region, ranges from 8,500 to 11,000 feet on cold slopes and on warm

slopes from 9,500 to 12,000 feet, and exists only at a small area on top of the southern end of the Guadalupe and on the higher peaks of the Sacramentos. The closest Canadian zone area from the sites is El Captain Peak which is approximately twenty-five miles to the southwest of the Yaso Hills Site. The Canadian zone within the Sacramentos is approximately seventy to eighty miles from the area of the sites.

This zone is forested by spruce, balsam, aspens, and conifers, with many of the Rocky Mountain species of trees and shrubs such as the red blueberry, mountain blueberry, currants and the red elderberry (Bailey 1913:47-49). Some forbs and grasses are also found in this high country, although they are not as varied as in the lower zones.

The animals of this restricted area include the White Mountain spruce squirrel, meadow mice, two species of little shrews, silver-haired and hoary bats; along with the many birds, including the olive-sided flycatcher, jays, crossbills, pine siskins, sparrows, Rocky Mountain creeper, red-headed junco, golden-crowned and ruby-crowned kinglets, and hermit thrushes (Bailey 1928:18).

More extensive lists of the plants and animals in these four zones including the scientific names, can be found in Life Zones and Crop Zones of New Mexico (Bailey 1913), but the descriptions above serve the purpose of showing the variety of natural flora and fauna available in the research area.

FLORA LISTS

The flora in the first two lists were collected during the project, pressed and dried in the field, and brought back to the lab to be identified. The identification was done by Dr. Richard Spellenberg, Department of Biology, New Mexico State University, who donated his time and knowledge.

The collection areas included the sites and the immediate area surrounding them within approximately a 75 meter radius.

In addition to the flora collected on the sites, the third list contains other plants noted by Waterfall (1946:459) from Observations on the Desert Gypsum Flora of Southwestern Texas and New Mexico. This list contains the characteristic gypsophiles that were found on gypsum plains and hills four miles south of Whites City to the state line, an area which includes and surrounds the two sites. Common names added to the list were taken from Gay and Dwyer (1970) and Gould (1951).

LA 14810

- Anulocaulis gypsogenus - Gyp-ringstem
Aristida adscensionis - Six weeks three-awn
Astragalus gypsodes - Locos
Bouteloua barbata - Six weeks gramma
Bouteloua breviseta - Chino grama
Canotia holancantha - Crucifixion-thorn
Clematis drummondii - Virgin's bower
Coldenia hispidissima
Condalia ericoides - Javelina bush
Ephredra trifurca - Mormon tea
Enneapogon desvauxii - Pappus grass
Erioneuron pulchellum - Fluff grass
Ferocactus spp. - Barrel cactus
Fouquieria splendens - Ocatillo
Gilia rigida - Starflower
Hilaria mutica - Tubosa
Ibervillea tenuisecta - Globeberry
Juniperus monosperma - One-seed juniper
Larrea tridentata - Creosote
Lepidium montanum - Pepper grass
Lycium berlandieri - Wolfberry
Machaeranthera australis
Mentzelia humilis - Stickleaf
Muhlenbergia arenacea - Ear muhly

LA 14810 (con't)

Nama carnosum

Nerisyrenia lineauifolia

Opuntia engelmannii - Pricklypear

Opuntia imbricata - Cholla

Opuntia leptocaulis - Christmas cholla

Polygala alba - White milkwort

Psilostrophe tagetina - Paper-flower

Rhus microphylla - Little-leaf sumac

Sartwellia flaveriae - Gypsum weed

Scleropogon brevifolius - Burro grass

Sphaeralcea angustifolia - Globemallow

Sporobolus nealleyi - Gypgrass

Thelysperma megapotamicum - Greenthread

Tridens muticus - Slim tridens

Viguiera cordifolia - Golden-eye

Yucca elata - Soaptree yucca

LA 14809

Agave lechuguilla - Mescal
Anulocaulis gypsogenus - Gyp-ringstem
Bouteloua brevisetia - Chino grama
Canotia holancantha - Crucifixion-thorn
Coldenia hispidissima
Condalia erocoides - Javelina bush
Dyssodia pentachaeta - Parralena
Ephedra trifurca - Mormon tea
Erioneuron pulchellum - Fluff grass
Hilaria mutica - Tubosa
Ibervillea tenuisecta - Globeberry
Juniperus monosperma - One-seed juniper
Larrea tridentata - Creosote
Lepidium montanum - Pepper grass
Lycium berlandieri - Wolfberry
Machaeranthera australis
Mahonia trifoliolata - Algerita
Nerisyrenia lineauifolia
Opuntia engelmannii - Prickly pear
Opuntia imbricata - Cholla
Opuntia leptocaulis - Christmas cholla
Perezia nana - Desert holly
Polygala alba - White milkwort
Rhus microphylla - Little-leaf sumac

LA 14809 (con't)

Sartwellia flaveriae - Gypsum weed

Scleropogon brevifolius - Burro grass

Senecio warnockii - Groundsel

Tridens muticus - Slim tridens

Viguiera cordifolia - Golden-eye

Yucca elata - Soaptree yucca

Yucca macrocarpa - Spanish bayonet

Waterfall, U.T. (1946:459)

Abronia nealleyi

Bouteloua eriopoda - Black grama

Ephedra torreyana - Torrey Mormon Tea

Euphorbia fendleri, var. *chactocalyx*

Euphorbia strictospora

Euphorbia serrula

Juniperus pincholi - Juniper

Kallstroemia brachystylis

Mirabilis multiflora

Muhlenbergia porteri - Bush muhly

Oenothera hartwegii, var. *filifolia*

Pappophorum wrightii

Senecio spartioides, var. *cyparissus*

Setaria macrotachya - Plains bristlegrass

Sporobolus contractus - Spike dropseed

Sporobolus cryptandrus - Sand dropseed

Sporobolus wrightii - Sacaton

Talinum aurantiacum

Viguiera dentata

DILLAHUNTY VISTA SITE

LOCATION

The Dillahunty Vista Site, Bureau of Land Management designation NTS-8, Museum of New Mexico designation LA 14809, is approximately ten meters east of the USGS Elevation Marker, Dillahunty Ranch, Elevation 3568 feet. The site is located in the Southwest $\frac{1}{4}$ of the Northeast $\frac{1}{4}$ of the Northwest $\frac{1}{4}$ of Section 8, Township 26 South, Range 26 East, Eddy County, New Mexico. The USGS Elevation Marker, Dillahunty Ranch, Elevation 3568 feet, was used as the datum point for collection and excavation.

PROCEDURES

Collection Procedures

In order to insure maximum accuracy in surface mapping, an artificial grid was established over the site area. 16 penny nails with flagging were driven into the ground at 5-meter intervals along north-south and east-west lines. These units were then subdivided into 1-meter squares by the use of two separate 30 meter tapes.

Before actual collection began, an attempt was made to define any special-use artifact clusters on the surface of the site. Two areas had large amounts of flakes present (see Figure 9). Most of these flakes were primary flakes with cortex present. Very few flakes or artifacts showed any indication of secondary retouch.

North of the site were several possible mescal pits in an early stage. No artifacts or flakes were noted in the vicinity of these areas.

After gridding the site, each 1-meter square that had lithic debris was photographed and mapped. An aluminum 1-meter square was used to

frame each square meter to be collected. Artifacts from each collection square were bagged separately after photography and mapping.

Testing

A test pit was placed in the most promising area containing a possible mescal pit. The test pit, a one meter square, was in Square 60E, 133N. The area immediately adjacent to the square had a small cluster of agave. The test pit encountered natural rock deposition from the very start. There was no evidence of strata disturbance throughout the sterile stratigraphy. No evidence of a mescal pit was noted.

Excavation Procedures

Several areas were chosen for limited excavation in the main grid system. Generally, there was little or no deposition of artifacts below the surface. The areas chosen for excavation, a good cross section of the site stratigraphy, yielded few additional flakes or artifacts.

After all surface material was mapped, photographed, collected and bagged, limited excavation took place in the following manner: 1) grid surface elevation was noted; 2) excavated one meter squares were taken down to sterile soil in arbitrary 10 cm. levels. Natural stratigraphic levels were not utilized as the only soil was deposited by aeolian activity. It was uniform in color and texture, and generally very shallow. All recovered cultural material was in the upper few centimeters or on the surface; 3) a combination of scrape shoveling and troweling was utilized for all excavation; 4) all of the excavated material was screened through a $\frac{1}{4}$ " mesh shaker screen.



Feature 3: Excavation: Facing West



Feature 1: Excavated area

DILLAHUNTY VISTA
LA 14809 (NTS-8)

LEGEND

- FLAKE
- ▣ UTILIZED FLAKE
- RETOUCHEE FLAKE
- CORE
- ⊙ CORE FRAGMENT
- SCRAPER
- GRAVER OR SPOKESHAVE
- HAMMERSTONE

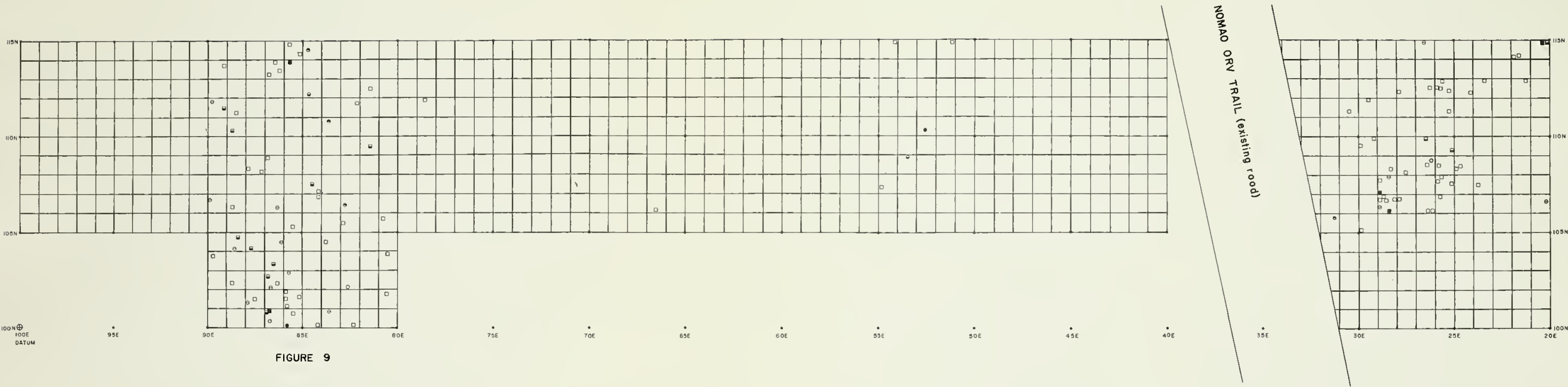
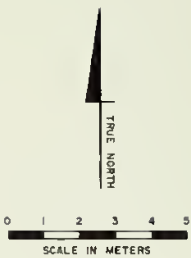
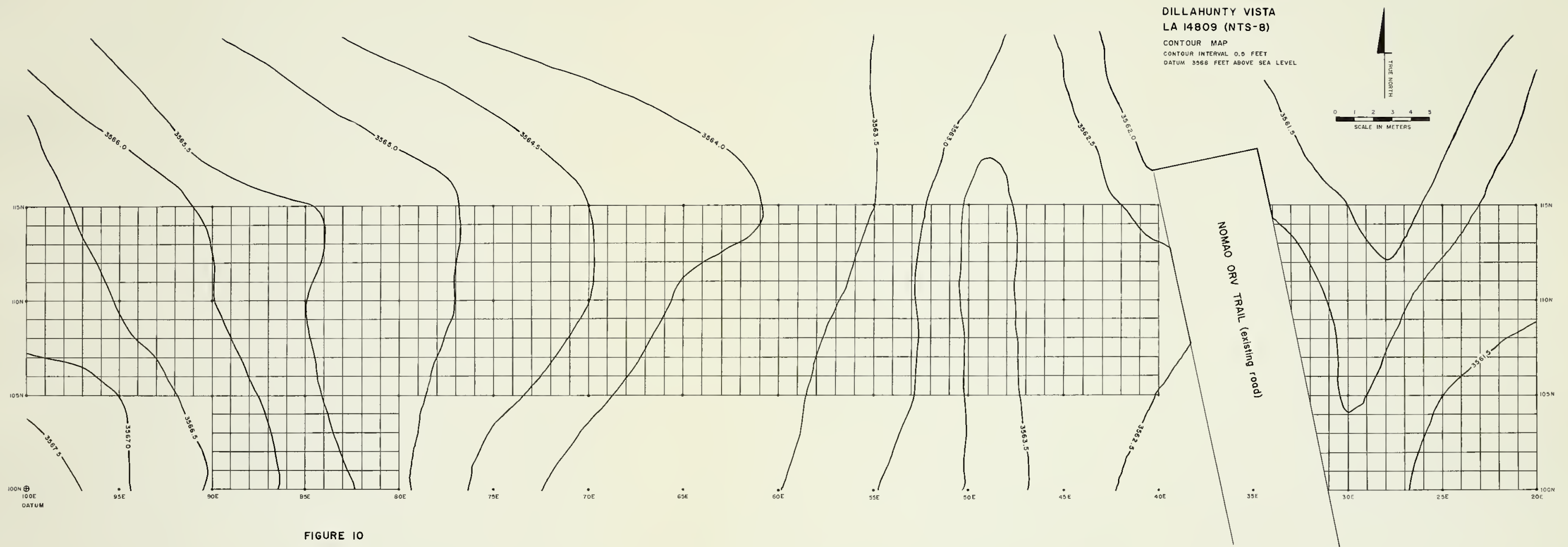


FIGURE 9



FEATURE 1

Location - 51E 110N, 50E 110N, 50E 111N, 49E 110N, 49E 111N, 48E 110N, 48E 111N, 47E 110N, 47E 111N.

Description:

These squares were investigated on October 21-22, 1976. Where there was vegetation within the feature area, the surface was stripped of short grasses and excavation was begun in arbitrary 10 centimeter levels below sub-datum (cmbsd) 1. All grid squares were excavated to a level of 20 cmbsd 1, with the exception of Grid Square 51E 110N, which was excavated to a depth of 50 cmbsd 1. Sub-datum 1 is located at the southwest corner of Square 50E 110N, at a height of 9 cm above the surface. All excavated fill material was screened through $\frac{1}{4}$ inch mesh hardware cloth.

Level 1, Surface - 10 cmbsd 1, ranged in thickness from 0-7 cm and consisted of a loose tan sandy aeolean soil containing scattered small pebbles and several larger pieces of tabular limestone. These ranged in size of 1 cm X 3 cm to 4 cm X 4 cm.

Two of the nine grid squares produced 4 flakes for the Level 1 total.

Level 2, 10 - 20 cmbsd 1, consisted of a continuation of the tan sandy soil encountered in Level 1. There was a thin scattering of small pebbles, 0.5 cm to 2 cm in diameter, throughout the entire level with a higher frequency of occurrence in Square 48E 111N.

The larger limestone rocks, 4 cm X 4 cm to 15 cm X 20 cm, were plotted on the grid maps and generally cluster in the IIN grids or northern half of the feature.

Root and rodent activity was encountered in Squares 48E IIN, 47E IIN and 47E IIN.

A soil color change to a sandy greyish tint was encountered and noted in the northeast quadrants of both Squares 48E IIN and 47E IIN and represents a thin localized lense in both cases.

Level 2 produced 7 flakes and two possible cores.

Grid Square 51E IIN alone was excavated to a depth below level 2.

Level 3, 20 - 30 cmbsd l, consisted of a tan sandy soil and produced no rocks, pebbles or artifacts.

Level 4, 30 - 40 cmbsd l, was a matrix of tan sandy soil, more compact than previous levels with thin streaks of white caliche throughout. There were a few very small pebbles, but no rocks. Level 4 produced no artifacts.

Level 5, 40 - 50 cmbsd l, is the same basic tan sandy soil encountered in previous levels, but is much harder and more compact due to a higher clay and caliche content. No large rocks were encountered, though a few very small rounded rocks were found. Level 5 produced no artifacts.

Discussion:

This feature was excavated because surface conditions indicated that this was a possible hearth, it had the greatest depth of soil deposition of any area within the parameters of the site and because carbon samples were most likely to be found. Several small pieces of possibly burned limestone were found in Level 2 of square 48E IIN but

no other evidence of firing was found on either soil or rock throughout the rest of Level 2. No ash or charcoal was encountered in any level of Feature 1.

In our opinion, this was not a hearth area, but a random rock scatter of natural origins.

Feature 1 produced a total of 11 flakes and 2 possible cores.

FEATURE 2

Location - 76E 110N, 76E 111N, 75E 110N, 75E 111N.

Description:

These grid squares were excavated on October 21, 1976. The surface was stripped of short grasses and excavation proceeded in arbitrary 10 cm levels below sub-datum 2, located 15 cm south of the southwest corner of grid square 75E 110N.

Grid Squares 75E 110N, 75E 111N and 76E 111N were excavated to a level of 20 cmbsd 2. Grid Square 76E 110N was excavated to a level of 30 cmbsd 2. All excavated fill material was screened through a $\frac{1}{4}$ inch mesh hardware cloth.

Level 1, Surface - 10 cmbsd 2, was quite thin due to the surface being from 7 cm to 11 cmbsd 2. This level consisted of a loose powdery tan aeolian soil, with a scattering of small surface gravel. It produced no artifacts.

Level 2, 10 - 20 cmbsd 2, was harder, more compact tan aeolian soil, with very small pebbles of calcium carbonate mixed throughout the level. All rocks were plotted on grid maps. Most were gypsum with a few tabular pieces of limestone. They were irregular shaped and ranged from

3 cm X 3 cm to 15 cm X 20 cm in size. They clustered in the approximate center of the feature.

A patch of grayish brown soil (10 cm X 5 cm X 3 cm) in the southwest corner of 76E 110N extended into 77E 110N at a depth of 12 cm to 15 cmbsd 2.

Three grid squares produced a level total of 10 flakes and 2 cores. Level 2 produced no charcoal or ash.

Level 3, 20 - 30 cmbsd 2, was excavated only in grid square 76E 110N. The tan soil was very hard. About 40% of the volume was small (1.5-2.5 cm) calcium carbonate pebbles. The larger rocks were gypsum, ranging in size from 3 cm X 5 cm up to 12 cm X 15 cm. They were plotted on a grid map.

An area of gypsum bedrock, 40 cm X 50 cm, was exposed in the southwest corner of this square at a depth of 27 cmbsd 2. A rodent hole was encountered in the east wall near the southeast corner of the square, but no rodent activity was evident in the rest of the square.

Level 3 produced no artifacts or charcoal.

Discussion:

This feature was chosen for excavation because of surface indications that it contained a hearth. The sub-surface rocks that were plotted tended to cluster in the center of this four grid area, but there was no indication that the rocks or the adjacent soil had been burned. Also, no charcoal was discovered during excavation.

In our opinion, this was not a hearth.

Feature 2 produced a total of 10 flakes and 2 cores.

FEATURE 3

Location - 68E 104N, 68E 105N, 67E 104N, 67E 105N.

Description:

Excavated October 22, 1976, these squares were stripped of short surface grasses and excavated in arbitrary 10 cm levels below sub-datum 3, located in the southwest corner of square 65E 105N. All grid squares were excavated to a level of 30 cmbsd 3. The surface lay between 10 - 20 cmbsd 3. All excavated fill material was screened through $\frac{1}{4}$ inch mesh hardware cloth.

Level 1, Surface - 20 cmbsd 3, consisted of a matrix of loose tan sandy soil interspersed with small pebbles. The larger rocks were composed of limestone, ranging in size from 2 cm X 4 cm up to 6 cm X 14 cm. These were plotted on the grid maps and were mainly in the western portion of the feature, Grid Squares 68E 104N and 68E 105N. Several of the rocks were darker in color and showed possible evidence of burning.

Grid Square 68E 105N contained an area of rodent activity along the eastern edge of the square 10 cm wide extending south to a length of 70 cm.

The four grid squares produced a level total of 22 flakes and no charcoal.

Level 2, 20 - 30 cmbsd 3, was a tan sandy soil more compact than in the preceding level. The northeast quadrant of Grid Square 67E 104N was particularly hard, interspersed with small limestone fragments. Roots were encountered throughout the level and a small amount of rodent activity was evident in the southeast corner of grid 67E 104N.

The larger limestone rocks were mapped. They ranged in size from 3 cm X 4 cm to 8 cm X 16 cm. They tended to be clustered in the southern portion of Grid Square 68E 104N and the northwest quadrant of Grid Square 67E 105N. Some of the rocks were reddish, indicating possible burning.

Level 2 produced a total of 9 flakes and 1 possible hammerstone. No charcoal was found.

Discussion:

The area occupied by Feature 3 was chosen for excavation because of surface indications that it could be a hearth. Several darkened and reddened stones were encountered in the two levels. However, these "burned" stones were interspersed with a large percentage of limestone rocks and fragments which showed no evidence of being burned. The surrounding soil showed no indications of burning and no charcoal was encountered.

It is our opinion that Feature 2 was not a hearth area, and that the discoloration of several stones was due to conditions other than fire exposure.

Feature 2 produced a total of 31 flakes and one possible hammerstone.

MATERIAL CULTURE

The artifacts recovered during excavation and surface collection of the Dillahunty site are categorized in this section. These categories are based largely on functions and are biased by the observations of the individual researcher.

Side Scraper

This specimen is well retouched by unifacial, parallel pressure flaking. The side scraper is bi-convex in cross section. The scraper bears the fine workmanship shown during Paleoindian times, and probably represents a pickup from another area.

Size:

Length: 26 mm

Width: 22 mm

Thickness: 5 mm

Material: Chert (1)

Blade

The only specimen of this category is a chert blade. It is triangular in cross section and shows edge wear from utilization.

Size:

Length: 17 mm

Width: 10 mm

Thickness: 4 mm

Material: Chert (1)

Combination Tools

These artifacts served more than one function. One specimen, a chert spokeshave/graver, was formed out of a large flake and has two narrow concave scraping edges. A graver point is located between the two small concave scraping edges. The scraping edge was formed by pressure flaking and flake removals are limited to the immediate working area. The other specimen is a chert spokeshave/graver/side scraper/end scraper. This tool shows heavy usage on its scraping edges. The scraping edges are steeply percussion flaked. Both tools have secondary pressure retouching.

Size Range:

Length: 37-38 mm

Width: 27-34 mm

Thickness: 11-16 mm

Material: Chert (2)

Gravers

This category contains two specimens, both of chert. Both specimens show intentional pressure flaking and wear patterns on the graving point.

Size Range:

Length: 15-21 mm

Width: 7-16 mm

Thickness: 5-8 mm

Material: Chert (2)

Hammerstones

There were two hammerstones. Both are quartzite nodules. One nodule has had a large flake driven off one end. This specimen exhibits large areas of crushed and bruised surfaces of the kind produced by repeated percussion. The other complete quartzite nodule exhibits a bruised surface on one end.

Size Range:

Length: 44-57 mm

Width: 39-42 mm

Thickness: 24-27 mm

Material: Quartzite (2)

Scraper Plane

There was one specimen, a large blocky fragment of chert which has evidently served as a core and subsequently has been modified as a scraper plane. The artifact exhibits very steep hard-hammer percussion flaking and has an exaggerated dome shaped cross section. It shows wear on its flat ventral surface and some secondary resharpening along the worked edges.

Size:

Length: 37 mm

Width: 21 mm

Thickness: 20 mm

Material: Chert (1)

Unutilized Flakes, Waste Flakes

There were 102 flakes that showed neither retouch or utilization.

Size Range:

Length: 11-42 mm

Width: 8-27 mm

Thickness: 2-17 mm

Material: Chert (80), Quartzite (19), Silicious siltstone (2),
and Chalcedony (1)

Utilized Flakes

There were 26 utilized flakes. The edges of these flakes show utilization as cutting implements or as scrapers, but no modification.

Size Range:

Length: 11-34 mm

Width: 5-21 mm

Thickness: 2-11 mm

Material: Chert (18), Quartzite (5), Silicious siltstone (2),
and Petrified wood (1)

Retouched Flakes

Eight flakes had been retouched by pressure flaking, either unifacially or bifacially. Most of the flakes included in this category were utilized as scrapers.

Size Range:

Length: 19-39 mm

Width: 11-30 mm

Thickness: 5-21 mm

Material: Chert (6), Silicious siltstone (1), and Quartzite (1)

Cores

The Dillahunty Vista Site produced a fair number of crudely worked nodules of silicious siltstone and chert from which flakes had been removed for the manufacture of other tools. The number of cores would have been higher than represented except that the small size of the naturally occurring cobbles from the Ogallala formation left little material after flake removal.

Size Range: .

Length: 36-50 mm

Width: 31-45 mm

Thickness: 22-32 mm

Material: Chert (2), Quartzite (1)

Core Fragments

These are the terminal ends of the natural cobble, or very large angular flakes, that had been hinge fractured during heavy hammer percussion.

Size Range:

Length: 19-42 mm

Width: 13-29 mm

Thickness: 7-19 mm

Material: Chert (12), Quartzite (2), and Silicious siltstone (2)

DILLAHUNTY VISTA SITE INVENTORY

<u>Artifacts</u>	<u>Number</u>	<u>Percentage</u>
Hammerstone	2	1.20
Point	2	1.20
Scraper	2	1.20
Blade	1	.60
Spokeshave and/or graver	4	2.41
Core or core fragment	19	11.45
Unutilized flakes	102	61.45
Utilized flakes	26	15.66
Retouched flakes	8	4.82
Total	166	99.99
<u>Lithics</u>		
With cortex	123	74.10
Without cortex	43	25.90
Total	166	100.00
<u>Knapping</u>		
Hard hammer	129	77.71
Soft hammer	20	12.04
Pressure flaking	16	9.64
No flaking (unflaked hammerstone)	11	.60
Total	166	99.99
<u>Material</u>		
Chert	127	76.50
Silicious siltstone	7	4.22
Quartzite	30	18.07
Chalcedony	1	.60
Petrified wood	1	.60
Total	166	99.99

YESO HILLS SITE

LOCATION

The Yeso Hills Site, Bureau of Land Management designation IITS-12, Museum of New Mexico designation LA 14810, is on the south side of a small gypsum rise on the west side of the Nomand Trail. The site is approximately 9,000 feet southeast of Red Top Tank, and 7,000 feet east of U.S. Highway 180. The site is in the Southeast $\frac{1}{4}$ of the Southeast $\frac{1}{4}$ of the Southwest $\frac{1}{4}$ of Section 13, Township 26 South, Range 24 East, Eddy County, New Mexico. Site elevation is 3875 feet above sea level. The datum (elevation 3900 feet) is a 36 inch piece of 1 $\frac{1}{4}$ " galvanized pipe that was driven down into a small gypsum rise just south of Area 1:

Distances From the Datum

Center of Sink A	135 ⁰ Magnetic north	143.75 meters
Center of Sink B	194 ⁰ Magnetic north	174.5 meters
Center of Sink C	228 ⁰ Magnetic north	229.5 meters
Center of Sink D	256 ⁰ Magnetic north	342.0 meters
100E 100N Area 1	357 ⁰ Magnetic north	21.70 meters
100E 100N Area 2	273 ⁰ Magnetic north	147.20 meters
100E 100N Area 3	273 ⁰ Magnetic north	237.7 meters

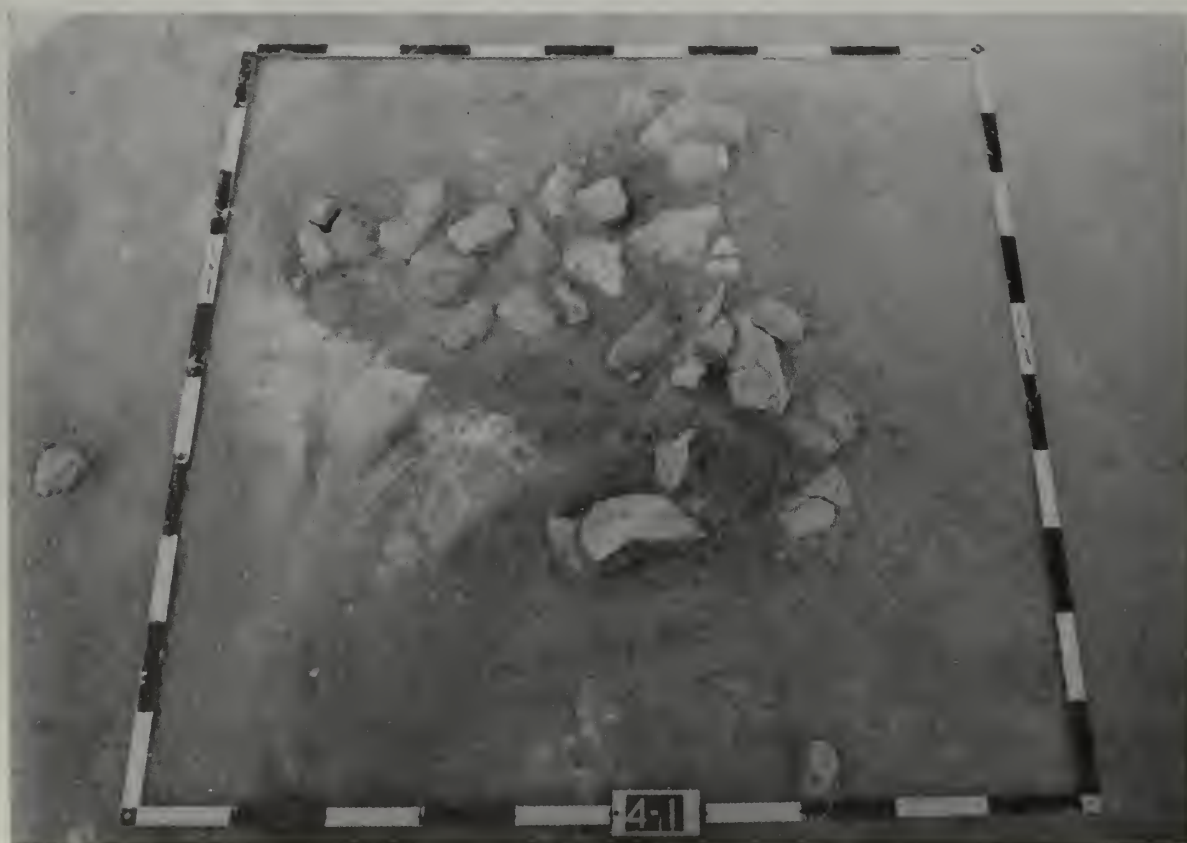
PROCEDURES

Collection Procedures

In order to insure maximum accuracy in surface mapping, an artificial grid was established over four large areas of artifact clusters. 16 penny nails with flagging were driven into the ground at 5 meter inter-



Overview of site: Located in the center above the road.



Hearth 2, Area 2: Hearth showing up in excavated area.

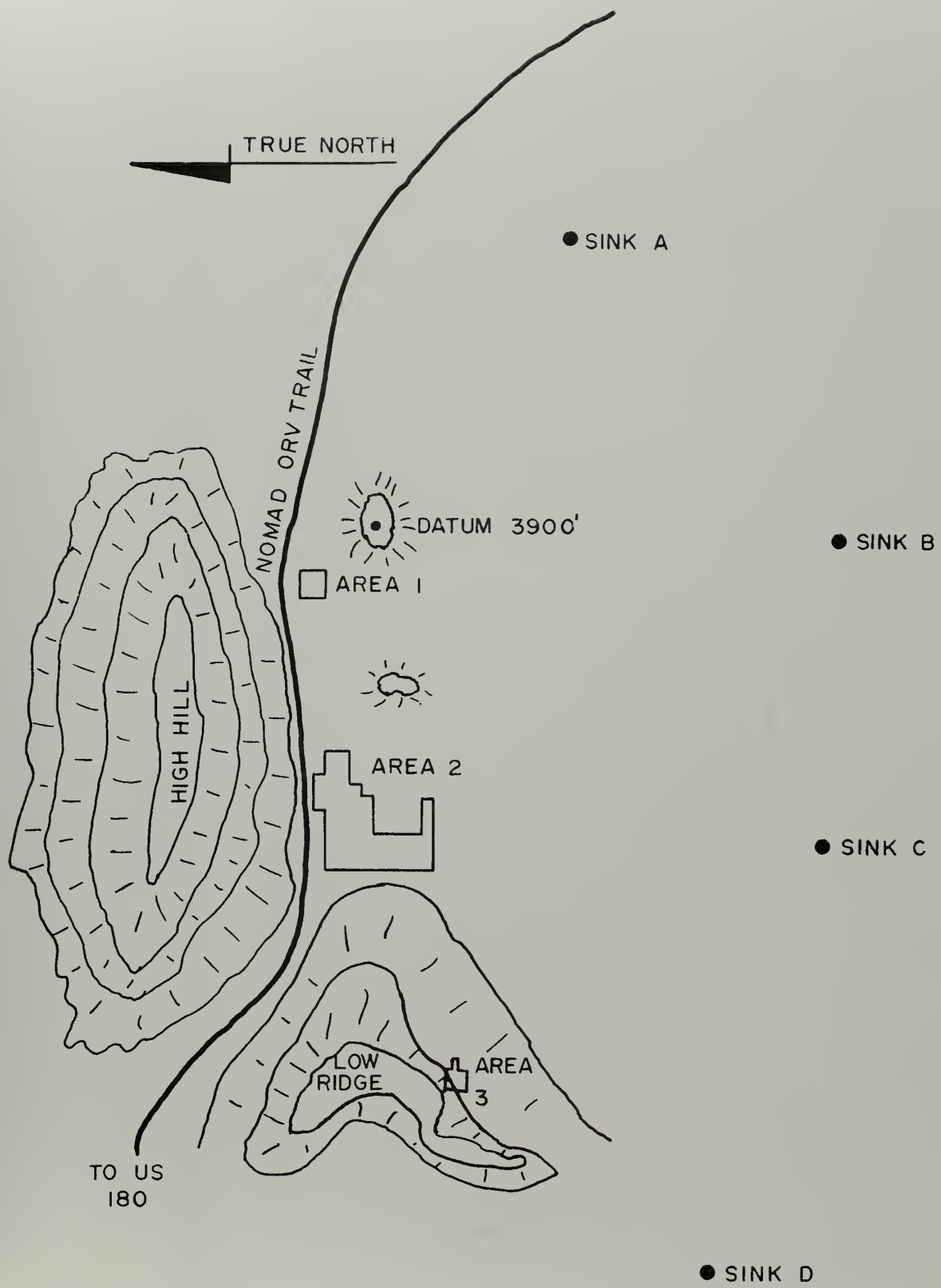


Figure II : YESO HILLS, AREA LOCATIONS

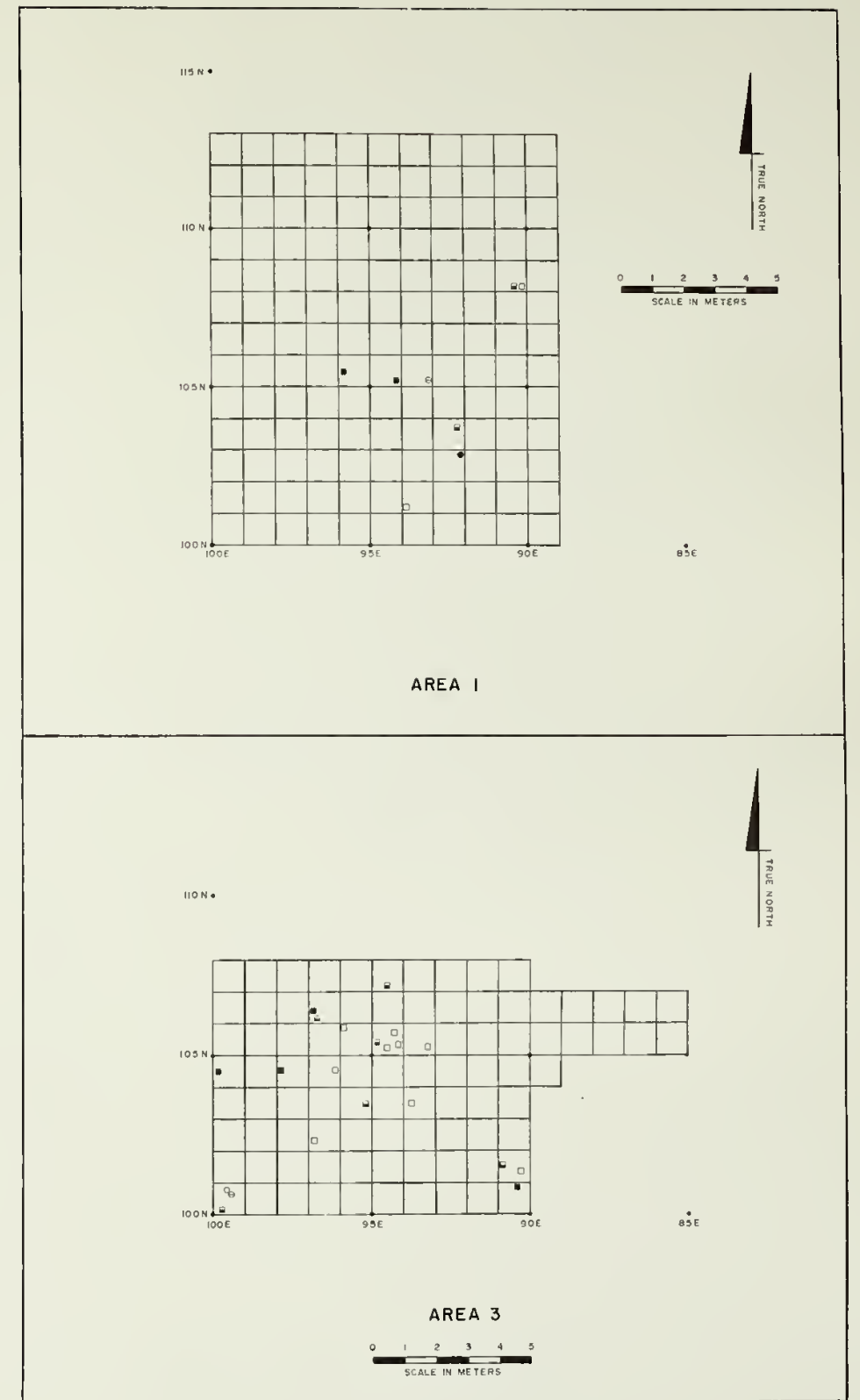


FIGURE 12

vals along north-south and east-west lines. These larger units were then subdivided into 1-meter squares by the use of two separate 30 meter tapes.

Before actual collection began, an attempt was made to define any special-use artifact clusters on the surface of the site. Four areas had large amounts of lithic debris present on the surface (see Figure 12). Most of the flakes present on the site were primary flakes with cortex present. Very few flakes or artifacts recovered showed any indication of secondary retouch.

Areas 1 and 3, located to the west of the datum, had surface indications of shallow hearths. After gridding the site areas, each 1 meter square that had lithic debris or features present was photographed and mapped. An aluminium 1 meter square was placed over each square meter to be collected. Each collection square was bagged separately after photography and mapping.

Excavation Procedures

Several hearths were chosen for excavation in areas 1, 2 and 3. Most of the site areas were completely denuded. The lithic debris and artifacts generally rested on gypsum bedrock.

After all surface material was mapped, photographed, collected, and bagged, feature excavations took place in the following manner: 1) grid surface was noted (cm. below datum); 2) excavated one meter squares were taken down to sterile soil in artificial 10 cm. levels. Natural stratigraphic levels were used in determining the hearth levels; in all other instances natural stratigraphy levels were not utilized as

the only soil was deposited by aeolian activity, uniform in color and texture, and generally very shallow to non-existent in deposition. All recovered cultural material was in the upper few centimeters or on the surface; 3) a combination of scrape shoveling and trowling was utilized for all excavation; 4) all of the excavated material was screened through a $\frac{1}{4}$ " mesh shaker screen.

AREA I

Feature I

Location: 94E 105N, 94E 106N.

Description:

These squares were excavated October 12, 1976 because of surface indications that this was a possible hearth area. Excavation was conducted in arbitrary 10 centimeter levels below subdatum (cmbsd) 1, located in the northeast corner of Grid Square 94E 106N. All excavated fill material was screened through a $\frac{1}{4}$ inch mesh hardware cloth screen.

Level 1, Surface-15 cmbsd 1, consisted of a tan sandy soil in the northern half of Square 94E 106N. The remainder of this level was composed of a compact gypsum material. Large angular limestone rocks were encountered in the northern portion of Square 94E 106N and scattered near the surface of 94E 105N. The limestone showed evidence of burning although no charcoal or ash was encountered in this level.

Grid Square 94E 105N yielded 2 flakes for the Level total.

Level 2, 15-25 cmbsd 1, was excavated only in Square 94E 106N due to encountering only sterile compact gypsum material in Square 94E 105N. This square continued to be fairly evenly divided between

sterile gypsum material in the southern portion and a tan sandy soil in the northern portion of the square. Four limestone rocks ranging from 2 cm X 5 cm to 10 cm X 15 cm and showing evidence of being burned were plotted on the grid map. Charcoal was discovered near the rocks and a sample secured although there was not enough for a radiocarbon date.

There were a large number of roots from large creosote and juniper bushes growing to the north and east of this square.

Level 2 produced no artifacts.

Discussion:

This area was chosen for excavation as a possible hearth. Although no well-structured hearth was defined and the soil showed little or no evidence of being burned, the scattered burned limestone and associated charcoal indicate that this was a disturbed hearth.

Feature 1 produced a total of 2 flakes.

Feature 2

Location: 99E 109N, 99E 110N, 98E 109N, 98E 110N.

Description:

This grid area was excavated October 13, 1976 because surface data indicated the presence of a hearth. Prior to excavation a flotation sample was taken from the center of grid square 99E 110N. The surface was cleared of a small amount of short grasses, then excavated to a level depth of 21 cmbsd 2. Sub-datum 2 is located at the northeast corner of grid square 97E 110N, at a height of 15 cm above the surface of the ground. All excavated material was passed through a $\frac{1}{4}$ inch mesh hardware cloth screen.

Level 1. Surface 21 cmbsd 2, consists of a compact tan sandy soil matrix with a cluster of burned limestone rocks, from 2 cm X 4 cm to 10 cm X 15 cm in size, in the center of the feature. All the rocks show evidence of burning and the soil within and immediately surrounding the burned rock area contained small pieces of charcoal scattered through the level. This rock cluster was about 70 cm square.

Charcoal from this level was dated at A.D. 1025 $\pm$ 70. Dating was done by the Geochronology Laboratory, University of Georgia (UGA 1444).

Level 1 produced no artifacts.

Discussion:

The excavated data supports the surface characteristics identifying this as a hearth area. Although it was the least disturbed hearth of any excavated on the site and contained the largest charcoal sample obtained, it unfortunately produced no artifacts.

AREA 2

Feature 3

Location: 55E 142N, 55E 143N, 54E 142N, 54E 143N.

Description:

This area was considered a possible hearth and excavated on October 15, 1976. The feature was investigated in arbitrary 10 cm levels below subdatum 3, located at the northwest corner of Grid 54E 142N. All grid squares were excavated to a level depth of 20 cmbsd 3, and all excavated fill material was screened through a $\frac{1}{4}$ inch mesh hardware cloth.

Level 1, Surface-10 cmbsd 3, ranged from 2 cm to 10 cm in thickness due to the uneven surface of the feature area. The southern portion of this feature was greatly disturbed due to root activity from a large juniper bush growing adjacent to the grid squares and also because of a previous rodent occupation.

The matrix consisted of a tan aeolian sandy soil overlying a decomposed gypsum. The limestone rocks encountered on and just below the surface ranged in size from 2 cm X 4 cm to 10 cm X 15 cm and generally tended to cluster in the southwest corner of Square 54E 143N. None exhibited any evidence of burning and no ash or charcoal was found in this level.

There was a generous distribution of chipped stone throughout this level but due to the extensive disturbance in Squares 55E 142N and 54E 142N those artifacts were not separated into levels.

Level 2, 10-20 cmbsd 3, consisted primarily of a decomposed gypsum that was both organically and culturally sterile.

Discussion:

This conglomeration of stones, thought to be a hearth area, was shown by excavation to be only a surface scatter of rocks. Although there was a higher frequency of chipped stone found within this feature than in surrounding areas, we feel that this did not appear to have enough significance to indicate a major chipping area concentration.

Because there was no evidence of fire exposure on the rocks and no ash or charcoal found in the levels of this feature, we feel that this area was not a hearth.

Feature 3 produced a total of 18 flakes and 3 cores.

AREA 3

Feature 4

Location: 88E 105N, 87E 105N, 87E 106N, 86E 105N, 86E 106N

Description:

This feature was excavated as a possible hearth area on October 14,

1976. Excavation was conducted in arbitrary 5 cm levels below subdatum 4, located 11 cm above the surface in the southeast corner of grid square 88 E 106N. All grids were excavated to a level depth of 20 cmbsd 4. All excavated fill material was screened through a $\frac{1}{4}$ inch mesh hardware cloth.

Level 1, Surface-15 cmbsd 4, contained a tan sandy soil matrix, roughly in the center of the feature surrounded on three sides by a sterile decomposed gypsum formation.

Prior to excavation a flotation sample was taken from the central limestone rock cluster in Grid Square 87E 105N.

All rock encountered was limestone, ranging in size from 4 cm X 6 cm up to 16 cm X 20 cm, and was located in one or the other of two distinct loci within Grid 87E 105N.

Yucca root disturbance was encountered in the central portions of the feature.

Level 1 produced a total of 1 flake. No ash or charcoal was found in the excavation of this level.

Level 2, 15-20 cmbsd 4, encountered a matrix material and configuration similar to that encountered in Level 1, a tan sandy soil in a central location surrounded by a decomposed gypsum material.

A few limestone rocks, 4 cm X 4 cm, were found in this level within the sand areas. None of the stones show any evidence of being burned.

Level 2 produced no artifacts or debris of cultural significance.

Discussion:

This feature was selected for excavation on surface indications that it could be a hearth area. Subsequent investigation revealed that none of the 3 dozen or so limestone rocks that were excavated exhibited evidence of being burned. No ash or charcoal was encountered in the excavation of the feature. In our opinion, this is not a hearth area.

Feature 4 produced a total of 1 flake, this being recovered from Level 1.

MATERIAL CULTURE

The artifacts recovered during the excavation and collection of the Yeso Hills Site are categorized in this section.

Blanks or Preforms

This category contains only one specimen. A blank or preform is a unfinished bifacial tool. The lone preform is ovate in shape. The edges show no sign of secondary retouch or use. It is clearly a unfinished projectile point.

Size:

Length: 33 mm

Width: 17 mm

Thickness: 7 mm

Material: Chert (1)

Distribution: Surface (1)

Blades

These blades are produced by hard-hammer percussion, resulting in long flakes with triangular cross sections. These specimens show

some intentional pressure flaking and wear patterns on one or more of their three edges.

Size:

Length: 17-40 mm

Width: 8-19 mm

Thickness: 3-12 mm

Material: Chert (2), Silicious siltstone (4)

Distribution: Surface (6)

Hammerstones

Two hammerstones were found. Both were quartzite nodules. Both nodules have had one large flake driven off of one end. One specimen exhibits large areas of crushed and bruised surfaces of the kind produced by repeated percussion. The other specimen exhibits two small areas of the same type battering.

Size Range:

Length: 42-47 mm

Width: 37-41 mm

Thickness: 27-33 mm

Material: Quartzite (2)

Distribution: Surface (2)

Knife

There is only one knife specimen. Bifacially worked tools with secondary retouch other than projectile points, which also exhibit the wear patterns of cutting are classified as knives. These should be distinguished from preforms, or blanks, which lack secondary retouch

and represent, in fact, stages in the manufacture of knives, projectile points, drills, and other bifacially worked tools. This specimen was made from a blade.

Size:

Length: 42 mm

Width: 18 mm

Thickness: 12 mm

Material: Chert (1)

Distribution: Surface (1)

Scraper Plane

There is one scraper plane specimen, a large blocky fragment of silicious siltstone which has been utilized as a scraper plane. It is slightly retouched with a flat percussion retouch which extends slightly up the working edge.

Size:

Length: 32 mm

Width: 30 mm

Thickness: 20 mm

Material: Silicious siltstone (1)

Distribution: Surface (1)

Convex End Scraper

There were seven convex end scrapers. One unifacial end scraper is made from a medium sized flake which is relatively thin at the scraping edge. The other six end scrapers are made from thick angular

flakes, steeply percussion flaked. None of the specimens resembles those found on Early Man sites.

Size:

Length: 23-34 mm

Width: 16-33 mm

Thickness: 10-20 mm

Material: Silicious siltstone (4), Chert (3)

Distribution: Surface (7)

Straight Edge Side Scraper

This category contains one straight edge side scraper made on a medium size flake. It is slightly retouched with a flat percussion retouch which extends slightly up on the working edge.

Size:

Length: 34 mm

Width: 18 mm

Thickness: 5 mm

Material: Chert (1)

Distribution: Surface (1)

Straight Edge End Scraper

There was one straight edge end scraper made on a medium size flake. It is bifacially retouched by pressure flaking. The retouch is very fine and the flake scars are very short.

Size:

Length: 27 mm

Width: 16 mm

Thickness: 13 mm

Material: Chert (1)

Distribution: Surface (1)

Narrow Concave Scrapers or Spokeshaves/Graver

These artifacts served more than one function. All are characterized by a narrow concave scraping edge on a small irregular flake. Several have a graver point between two concave scraping edges. The scraping edge was formed by pressure flaking and flake removals are limited to the immediate working area.

Size Range:

Length: 21-42 mm

Width: 17-28 mm

Thickness: 6-14 mm

Material: Chert (3), Silicious siltstone (3)

Distribution: Surface (6)

Gravers

The two gravers were made out of triangular flakes. A point of the triangle was steeply percussion flaked along the margin producing a graver point.

Size Range:

Length: 24-31 mm

Width: 10-14 mm

Thickness: 5-7 mm

Material: Chert (2)

Distribution: Surface (2)

Unutilized Flakes, Waste Flakes

There were 132 flakes that showed neither retouch or utilization.

Size Range:

Length: 11-49 mm

Width: 4-36 mm

Thickness: 3-19 mm

Material: Silicious siltstone (99), Chert (26), Quartzite (3),
Chalcedony (2), and Jasper (2)

Utilized Flakes

This category contained 57 flakes that have been utilized, but not modified. The edges of these flakes show utilization as cutting implements or as scrapers.

Size Range:

Length: 16-46 mm

Width: 12-29 mm

Thickness: 4-16 mm

Material: Silicious siltstone (39), Chert (16), Chalcedony (1),
and Limestone (1)

Retouched Flakes

This category is comprised of 26 flakes that have been retouched by pressure flaking either unifacially or bifacially. Most of the tools included in this category were utilized as scrapers.

Size Range:

Length: 15-37 mm

Width: 12-28 mm

Thickness: 3-24 mm

Material: Silicious siltstone (15), Chert.(10), and Chalcedony (1).

Cores

The Yeso Hills Site produced a fair number of crudely worked nodules of silicious siltstone and chert from which flakes had been removed for the manufacture of other tools (cores). The number of cores would have been higher than represented except that the small size of the naturally occurring cobbles from the Ogallala formation left little material after flake removal.

Size Range:

Length: 28-40 mm

Width: 20-35 mm

Thickness: 9-27 mm

Material: Silicious siltstone (10), Chert (6)

Core Fragments

These are the terminal ends of the natural cobble, or very large thick angular flakes, that had been hinge fractured during heavy hammer percussion.

Size Range:

Length: 19-45 mm

Width: 10-35 mm

Thickness: 6-29 mm

Material: Silicious siltstone (39), Chert' (14)

YESO HILLS SITE INVENTORY

<u>Artifacts</u>	<u>Number</u>	<u>Percentage</u>
Hammerstone	2	.63
Point	6	1.89
Scraper	9	2.84
Blade	6	1.89
Spokeshave and/or graver	8	2.52
Preform	1	.32
Knife	1	.32
Core or core fragment	69	21.77
Unutilized flakes	132	41.65
Utilized flakes	57	17.98
Retouched flakes	26	8.20
Total	317	100.01

Lithics

With cortex	229	72.75
Without cortex	88	27.76
Total	317	100.01

Knapping

Hard hammer	257	81.08
Soft hammer	22	6.94
Pressure flaking	38	11.99
Total	317	100.01

Material

Chert	89	28.07
Silicious siltstone	215	67.81
Quartzite	5	1.58
Chalcedony	5	1.58
Jasper	2	.63
Limestone	1	.32
Total	317	99.99

LABORATORY PROCEDURES

Only stone artifacts were found during the project. No sherds were encountered during collection, excavation, or survey. Due to the openness of the terrain and the shallowness of the stratigraphy it is not surprising that no perishable material was recovered. In addition, no bone or obsidian was encountered.

COLLECTION OF CHARCOAL

Two hearths on the Yeso Hills Site produced charcoal, but only one (Feature 2) had enough charcoal for a date. Both hearths were collected in the following manner: 1) all tools were washed with distilled water; 2) collection was by trowel and tweezers; 3) collected charcoal was placed in a new clean plastic bag, labeled, and sealed. The sealed bag was then placed in another plastic bag and the same procedure was followed; 4) the sample from feature 2 was sent to the University of Georgia laboratory where the sample produced a radio-carbon date of A.D. 1025 $\pm$ 70.

MECHANICAL TREATMENT

All recovered artifacts, flakes, etc. were scrubbed and washed, prior to being numbered. All numbering was done with india ink and covered with clear fingernail polish. The collections are stored at the New Mexico State University Museum and have been assigned NMSU accession numbers.

TECHNOLOGICAL, TYPOLOGICAL AND FUNCTIONAL ANALYSIS

The processes that shaped the artifacts, their typological categories and the functions of the various artifacts was determined in the laboratory. The physical characteristics of the artifacts (e.g., material, length, width, thickness and location) and their typological function is recorded in the accession number record that is kept for all incoming materials deposited in the New Mexico State University Museum. The technological and functional characteristics of the artifacts will be discussed in the interpretation section of this report.

PHOTOGRAPHIC METHOD UTILIZED

Justification

It was felt that a 5"X7" black and white photograph would provide an excellent working map of each one meter square collected. This method was to be used in conjunction with a surface map of each square.

Method Utilized

Each square that had lithic debris, artifacts or features was photographed with a 35 mm camera with a wide angle lens, using Tri-X film. An aluminium one meter grid square was placed around the square meter to be photographed. The edges of the aluminium square were marked in 10 cm intervals and were utilized as a built in scale. Two sides of the square had north arrows to indicate true north. After the first day, a flagged nail was placed just above each artifact for easier artifact identification.

A 9 X 12 plastic ground cloth was held over the photographer while the photo was being taken. This method eliminated any shadows or uneven lighting in the square. The use of Tri-X film permitted a smaller lens opening, thus increasing the depth of field.

Results

While the method seemed like a practical approach to providing a working map of the square, the method had several unexpected drawbacks. The most difficult one was the actual photography in the field. It was almost impossible to hold the ground cloth as a shade in a 20-40 mile per hour gusty wind. There were times when as many as six individuals were required to hold it in place due to the extreme wind and the sail features of the ground cloth. The ground cloth also tended to beat the photographer into the ground during high winds.

The method did not provide the detail for easy identification of the artifact in the photograph even with the addition of a flagged nail above the artifact. The surface grid maps used throughout the project provided easier access and readability than did the photographs of the individual squares. It was especially hard to identify the artifacts in the photos if there were numerous cobbles and local vegetation in the photo.

The photos in the excavation squares did show greater detail than did the grid maps and in this aspect the photographic method proved itself.

Summary

The photography of a large number of meter squares is a time consuming activity that produces limited results. The use of photography in excavated areas has proven itself over the years and our results tended to reinforce this. The use of it for a working map in a localized lithic quarry left much to be desired. One of the bright spots was the use of the metal photographic meter square. The use of this tool increased efficiency and provided an easily recognized boundary in the photograph. It also made surface mapping much more efficient.

NOMAD ORV TRAIL SURVEY

BACKGROUND

It was found that part of the original Nomad ORV Trail system fell a few feet into Texas, and the Texas rancher did not want the ORV Trail on his property. This action prompted the Roswell District Office of the Bureau of Land Management to find an alternate route for that portion of the trail. A 1.7 mile alternate route was decided upon. The archaeological clearance for the 1.7 miles of the Nomad ORV Trail was included in the contract between New Mexico State University and the Bureau of Land Management.

SURVEY PROCEDURES

The survey route was marked by the Bureau of Land Management by two methods: 1) The placement of ORV Trail signs on 4"x4" cedar posts and 2) by red flagging. An existing road was included in part of the proposed right-of-way.

An intensive survey of the proposed right-of-way was performed by three archaeologists in the following manner: One drove a vehicle to the end of the line and walked back over the center line. The other two archaeologists walked on each side of the proposed roadway about 25 feet from the centerline. The centerline of the surveyed route was flagged by white flagging.

RESULTS OF THE SURVEY

No sites were noted on the proposed right-of-way. Two isolated artifacts were recorded and collected (see Figure 2).

Isolated Point: This artifact was located approximately two meters north of the existing dirt road in the Northeast $\frac{1}{4}$ of the Northwest $\frac{1}{4}$ of the Northeast $\frac{1}{4}$ of Section 33, Township 26 South, Range 26 East, Eddy County, New Mexico. The point is made of a brown and white chert has a convex base, narrows at the neck, and has weak shoulders. The point is similar to the Archaic point illustrated by Jelinek (1967:Plate XVI,D). The neck width (14mm) corresponds to Henderson's (1966:45) Archaic criteria.

Isolated Scraper: This artifact was located about three meters south of the existing dirt road in the Southwest $\frac{1}{4}$ of the Northwest $\frac{1}{4}$ of the Northwest $\frac{1}{4}$ of Section 34, Township 26 South, Range 26 East, Eddy County, New Mexico. The scraper is a Folsom end scraper with a graver on one side. It is very well made out of light pink, fine-grained quartzite. Length: 26 mm ; Width: 20 mm ; Thickness: 5 mm.

RECOMMENDATIONS

It is recommended that the proposed 1.7 mile Nomad ORV Trail realignment be given archaeological clearance for the 100' right-of-way. The area where no road currently exists seems to be relatively free of any cultural material. The portion of the Nomad Trail that follows the existing road probably had cultural remains or sites outside of the right-of-way. Any movement of this portion of the trail should be looked at carefully.



1.7 miles ORV Trail Survey



Dillahunty Vista Site



Yeso Hills Site

AN ETHNOGRAPHIC MODEL FOR EXPLOITATION OF THE
ENVIRONMENT: THE MESCALERO EXAMPLE

INTRODUCTION

The people utilizing the two archaeological sites for the procurement of lithic material, probably, were taking advantage of the variety of edible plants available in the immediate area, as well as the available game. Since these are quarry sites, we presume, they are connected with male activities. Actual on-site use of the vegetation involved little food preparation, as is shown by the lack of ceramics and grinding implements on the sites.

This discussion of exploitation of the environment will be concerned with these people's subsistence, based on the native plant and animal life of the entire region with its varied eco-systems. In order to formulate this relationship between humans and environment, an ethnographic model will be used. Due to the large amount of research and documentation available on the Mescalero Apache, who inhabited much of the same region, they will be used as the model.

LOCATION

The area inhabited by the Mescalero Apache covered a large part of southeastern and central New Mexico. They were divided into two bands, one staying most often in the vicinity of the Sacramento and Sierra Blanca mountain ranges and the second residing farther to the east with smaller offshoots often camping on the flats (Castetter and Opler 1936:5). Although divided into two bands, they recognized them-

selves as a single people. At times they ranged as far north as Santa Fe, east to northwestern Texas and south into northern Mexico. Their favorite haunts were in the San Andres, Sacramento, and Guadalupe mountain ranges (Castetter and Opler 1936:5-6). Without restricting interest to either the nuclear settlement or to the maximum range of the group, an approximation of the total area dominated by the Mescalero can be given as the extent of the drainage of the Pecos River Basin (Henderson 1976:30).

The Guadalupe Mountain range of the Mescalero's territory includes a portion of the extension of the Jornada Branch of the Mogollon Culture proposed by Corley (1965) and encompasses the two archaeological sites under consideration.

SUBSISTENCE PATTERNS

Mescalero subsistence, appearing to represent a balance between hunting and collecting wild plant food, required utilization of extensive territorial regions based on the geographical distribution of both plants and animals (Basehart 1960:10).

Because of these subsistence patterns, the Mescaleros were a highly mobile group, moving with seasonal changes of weather and following migrations of the larger game and the wild food harvests as they occurred.

The male activity, hunting, even when considering only the animals of major subsistence importance, involved deer congregating in the mountains, buffalo of the high plains, and antelope found in the lower elevations. The females provided the most dependable and consistent contribution to the diet by collecting wild plants which likewise have

restricted distributions (Basehart 1960:10). As far as farming was concerned, the later efforts toward cultivating plants was of a very limited nature and influence on the Mescalero's mode of existence slight (Castetter and Opler 1936:15).

Animals as Resources

Castetter and Opler note that the Mescalero were somewhat dependent upon the buffalo for meat, skins, and sinew, but also ate the flesh of deer, antelope, elk, mountain sheep, cottontail rabbits, opossum, and wood rats (Castetter and Opler 1936:25). Jack-rabbit, squirrel, prairie-dog, ringtail cat, and peccary flesh, along with fish, were eaten by some, but not by others of the group. Birds were generally not favored as food. Bear and mountain lion usually were eaten in ceremonial context only (Castetter and Opler 1936:25-26).

Basehart considers the deer, antelope, and bison of greatest significance in the Mescalero diet with the prairie-dog and rabbit, although not as highly regarded, becoming important in periods when other resources were scarce (Basehart 1960:11).

Deer meat was cooked fresh and also made into jerky, while the internal organs, brains, and even the hooves could be prepared as food. The antelope were used in a similar manner except that the antelope was credited with less mystical properties, thus less attention was given to utilization of the whole animal (Basehart 1974:16). There were many practical uses for the hides, antler and bones, of both deer and antelope, but only the parts of the deer were used for ceremonial purposes (Castetter and Opler 1936:26). Deerhide clothing and blankets were

especially prized, with the hooves made into rattles and used in various rituals.

Bison meat, which was used fresh, jerked or dried, was highly valued as a food because it was said not to spoil as easily as other meats during storage (Basehart 1960:20). The hides were preferred for tipi covers and blankets. They were also used as clothing, arrow quivers, storage bags and trunks. The bones, horns, sinew, stomach, and occasionally even the dung were utilized (Basehart 1960:24-25). Buffalo and horse hair, as well as rawhide, was twisted into ropes, with all the equipment needed for the horses also being made from rawhide (Castetter and Opler 1936:19).

Plants as Resources

For the study of food uses of desert plants, five groups have been formed by Burgess. They are: (1) fruits, (2) roots, rhizomes, bulbs, corns, and tubers high in starch content, (3) mescal, (4) pinole and dried seeds, and (5) greens and flavoring pot herbs of various kinds (Burgess 1965:9). The vegetation discussed in this study will be divided into these groups.

Fruits

In this semi-arid region, cacti are one of the major fruit producers. One of the most important groups of fruit-bearing cacti for the Mescalero people were the yuccas. Fruits of several species were utilized for food, with the datil (Y. baccata) valued because of its abundance and excellent storage properties (Basehart 1960:33). The fruits of the soapweed (Y. elata) and palma (Y. macrocarpa) were also sometimes used (Castetter and Opler 1936:39). After roasting, peeling, and removing the seeds,

these fruits could be dried or ground to be made into cakes with the juice often used to moisten and preserve them (Castetter and Opler 1936: 39). The datil fruit was also connected with various Mescalero ceremonial rituals.

The fruit of a number of species of Opuntia, prickly pear cactus, were eaten fresh or dried for storage. Species of both the Echinocereus and Neomammillaria, which include the hedgehog, rainbow, and pincushion cactus, produced fruits that were gathered and eaten fresh; while the sunset cactus (N. grahmi) fruit was suitable for drying and storage if it was cooked before being eaten (Castetter and Opler 1936:40-41).

Species of wild strawberry, gooseberry, raspberry, elder-berry, sumac berry, chokecherry, grape, current (manzanita), and plum, along with privet fruit, rosehips, primrose fruit, algerita and juniper berries, were all eaten occasionally, although none of these made up a significant part of the Mescalero diet (Castetter and Opler 1936:42-47; Basehart 1960: 46-50). These various wild fruits were most often consumed fresh where found, but some of the more abundant species were gathered to make jellies or preserves.

Roots, rhizomes, bulbs, corms, and tubers

Wild potatoes were utilized by the Mescalero with three different species noted by Castetter and Opler. Solanum fendleri, found usually in the mountains, was boiled unpeeled and eaten. S. jamesi, from the valleys, was boiled or was sometimes dried, stored, and later ground for making bread. A wild sweet potato (Hoffmanseggia densiflora), only growing on the flats, was eaten raw or cooked (Castetter and Opler 1936: 42).

Basehart notes three types of wild onions as being gathered by the Mescalero, but does not classify them by name. They grow in much the same provinces as the wild potatoes. These were said to be used in the raw state, cooked, or as seasoning in other foods (Basehart 1960:45-46). Castetter and Opler name two types, Allium cernuum and A. geyeri, and say they were eaten raw or used for flavoring soups (Castetter and Opler 1936:47).

Rootstocks of the cat-tail (Typha latifolia) and wild celery (Cymopterus fendleri), bulbs of the wood-sorrel (Oxalis violacea), and corm-like tubers of the sedge (Cyperus fenderianus) were either cooked or eaten as food (Castetter 1935:29). A parasitic angiosperm Ammbroma sonorae, commonly called sand root, is found on the roots of certain small desert shrubs and was often used in much the same way as other rootstocks (Castetter 1935:51).

Mescal

Under the heading of Mescal, Burgess lumps together species of Agave, Yucca, Nolina, and Dasyllirion as conspicuous desert plants prepared mainly by roasting the hearts in pits until they were reduced to a sugary paste which could be used immediately or dried and stored (Burgess 1965:10).

The most important of these to the Mescalero was the Agave, especially A. parryi, which was the source of the food originally known as mescal from which this class has been named (Castetter and Opler 1936:35). Some of the other species of Agave such as A. lechuguilla and

A. neomexicana were also utilized as mescal (Castetter et.al.1938:22-29).

Many different rituals and beliefs were connected with the roasting of mescal, with many varied uses for the finished product. The roasted outer leaves could be eaten much as we do the globe artichoke. The heart also was eaten as soon as baked or dried. After drying, the mescal was often combined with ground pinyon seeds (Pinus edulis), walnuts (Juglans major), juniper berries (Juniperus scopulorum), or the fruits of the three-leaved sumac (Rhus trilobata) (Castetter and Opler 1936:37).

Sotol (Dasyllirion wheeleri), amole (Yucca glauca), and soapweed (Yucca elata) were used in much the same way as the species of Agave, with the heart being roasted. The emerging sotol flower stalks, as well as those of bear grass (Nolina microcarpa) and amole could be eaten raw, boiled, or roasted (Castetter and Opler 1936:38). After boiling, these stalks could also be dried and stored for future use. The flowers of Y. elata and Y. glauca were also boiled and eaten as a vegetable by the Mescaleros.

Pinole and dried seeds

Mesquite, in the opinion of Bell and Castetter, was one of the most important plant staples of the Southwest, with Prosopis chilensis the best known and most widespread species of this genus of plants (Bell and Castetter 1937). It was the storage properties of the dried mesquite bean which caused the Mescalero to value it as a major part of their subsistence, although the plants had limited distribution and crops varied from year to year (Basehart 1960:37). Beans from these

plants were boiled and squeezed to produce a sort of gravy used as a drink (Basehart 1960:33) or cooked with meat. The entire pod could be boiled to make pudding, as well as being ground into a flour (Castetter and Opler 1936:41). This mesquite flour was used for the Mescalero's favorite pinole, and was made into bread, or a sort of pancake (Castetter 1935:45; Castetter and Opler 1936:41).

The screwbean (Prosopis pubescens) should also be mentioned as part of this group of plants which are considered to be most important native plant staples of the Southwest. Commonly called screw-pod mesquite, the pods are somewhat sweeter than those of other mesquite and were eaten raw as a delicacy, although they were usually ground and made into bread (Castetter and Opler 1936:41-42).

Walnuts and pinyons, as well as the mesquite bean, were often ground into a fine flour called pinole. Walnuts (Juglans major) were eaten raw or mixed with mesquite gravy as well as being ground to be combined with mescal, while pinyons (Pinus edulis) were used raw after being ground and rolled into balls or were roasted and mixed with yucca fruits to make a pudding (Castetter and Opler 1936:42-43). Acorns (Quercus spp.) were used raw, or boiled and pounded to be mixed with mescal, but the Mescalero did not like the taste and acorns did not contribute significantly to their diet (Basehart 1960:42).

Basehart notes that several types of grasses were used by the Mescalero. The seeds were pulled by hand and taken to camp for further processing such as winnowing and grinding (Basehart 1960:44-45). This flour was commonly used to make a mush.

Seeds of the white evening primrose (Anogra albicaulis) were also occasionally ground and made into a gravy or boiled in soups while the seeds of the anglepod (Vincetoxicum productum) and of the Maurandia wislizeni could be eaten fresh as well as boiled (Castetter and Opler 1936:45). The pods of the New Mexico locust (Robinia neomexicana) were utilized in a manner similar to mesquite. The flowers were also edible. In terms of food scarcity, the seeds of the western yellow pine (Pinus scorpulorum) and of the white pine (Pinus flexilis) were roasted and hulled or sometimes ground (shell and all) and eaten (Castetter and Opler 1936:43).

Although not actually made into pinole, for the lack of a better category in which to place it, the extraction of the sugary substance from tree bark will be mentioned here. The Mescalero made sugar by boiling the bark of the western yellow pine, aspen (Populus tremuloides), sumac (Rhux crismontana), and box elder maple (Acer negundo) until the sugar would crystallize out. The sap of the New Mexico maple (Acer neomexicana) was collected for sugar and syrup (Castetter and Opler 1936:43-44).

Greens and flavoring pot herbs

Castetter and Opler list the following as greens used by the Apache: tumbleweed (Amaranthus graecizans), purslane (Portulaca oleracea), lamb's quarter (Chenopodium alba), pigweed (Amaranthus retroflexus), leaves of Rumex occidentalis osha (Ligusticum porteri) marigold (Dysodia papposa), and sheperd's purse (Capsella bursa-pastoris) (Castetter and Opler 1936:46-47). All but the latter two could be eaten raw, but most of them were boiled or combined with other food for cooking.

Leaves of dragonhead (Dracocephalum parviflorum), mint (Mentha penardi), horsemint (Monarda menthaefolia), pennyroyal (Hedeoma nana), a sage, Artimisia ludoviciana, hops (Humulus lupulus neomexicanus), and the wild onions were among the plants used for flavoring food (Castetter and Opler 1936:47).

Other Uses of Plants

The Mescalero, whose subsistence patterns demanded much movement, could not develop a very elaborate material culture. Their material culture was built from the natural objects they encountered in their hunting and gathering. Under the heading of "Animals as Resources" some of the Mescalero's utilization of the animals for other purposes than food were briefly described.

As for the importance of vegetation to the material culture, the characteristic dwelling of these Apache tribes was a domeshaped structure covered with grass thatching, hides, or bark (Castetter and Bell 1936: 19). Household utensils included pitch covered water jars, basket trays, large burden baskets of twine work, conveyors of wood and rawhide to gather firewood, combs of mountain mahogany (Cercocarpus montanus), and brushes of folded and pounded mescal or sotol leaves (Castetter and Opler 1936:19). The native vegetation was also used in the construction of their musical instruments, as well as their weapons of war and hunting equipment.

INTERPRETATIONS

The Yeso Hills Site did have a number of sinkholes in association with the site. The vegetation in and around the sinkholes was thicker and more luxuriant than that found on the site. Several of the sinks appear to hold water for extended periods of time, but the potability of the water would be questionable due to the large amount of gypsum present.

Lithic concentrations in two locations within Area 2 appear to be concentrated because of natural geographical topography rather than random scattering due to human activity. Both areas were very slightly dish shaped (concave and less than 6 inches in depth -- does not show well on the contour map) so that water and wind erosion tended to concentrate the lithic material in these natural depressions.

Area 1 had a small concentration of artifacts and associated hearths. Whether the occupation of Area 1 was the same as that of Area 2 or of two different occupations does not change the results of the findings. Both areas produced the same type of lithic debris and artifacts, and both had hearths in association with the site.

The small size of the cobbles present raises the question, why was the area being utilized as a quarry site? A look at the local geology will illustrate that there are very few outcroppings of suitable lithic material for artifact manufacture in the area. The remnants of the Ogallala Formation on the site provides one of the few source areas for these materials.

The Dillahunty Vista Site appeared to have several rock alignments, suggesting that they could possibly be small mescal pits in an early stage of usage. A small isolated community of agave did grow in the immediate vicinity to the north of the site in close proximity to these rock alignments. Testing in the center of the most promising small rock cluster indicated that the soil was totally sterile and the rock clusters occurred naturally.

The site was located one and one-half miles north of a spring and one and one-half miles south of Cottonwood Draw, a permanent spring fed stream. Water could have been obtained at either of these two excellent sources.

The lithic debris was almost identical to that found on the Yeso Hills Site. Again, the naturally occurring cobbles were part of a local quarry source and the area was utilized for the procurement of lithic material.

Both the Dillahunty Vista Site and the Yeso Hills Site contained only a limited amount of lithic debris. The probable reason for the limited usage of the sites is the size and quantity of raw source material available at either site. There was virtually no source material presently available for manufacture of large bifaces or blades. The original cobble size and the quality of the material probably was a factor why earlier inhabitants of the area did not utilize the area for their quarry area.

The total absence of ceramics on both sites, upon first examination, suggested that the sites might either have been occupied in the Archaic or during Apache times. However, the lithic debitage did not seem to fit the Archaic tool assemblages that occur elsewhere in New Mexico,

nor did it seem to tie in with any degree of certainty to Apache occupation. Upon further examination of the lithic assemblages from both sites, it was noted that the lithic artifacts corresponded very closely with those found on ceramic sites in the Mescalero Sands. Those site had been assigned to the Querecho Phase of the Jornada Mogollon (Beckett 1975, 1976). Later, a C-14 date from the Yeso Hills Site, Area 1, Hearth 2, produced an A.D. 1025 $\pm$ 70 date, and added support for our proposed Querecho Phase occupation.

Corley's proposed Eastern Extension of the Jornada Mogollon for southeastern New Mexico (See Appendix A), appears to be correct as far as the date is concerned for the Querecho Phase. The A.D. 1025 of hearth 2 and the site artifact assemblage falls within his proposed A.D. 950 - 1100 dates.

Both archaeological sites, the Yeso Hills Site and the Dillahunty Site, contained essentially the same type of artifact assemblages. There were few artifacts found in association with either of them, this could be explained in two ways: 1) few artifacts remained after they had been surface hunted by collectors; or 2) they were lithic procurement sites. There is no doubt that the sites had probably been surface hunted in the past and many of the more desirable artifacts had been removed from the sites; however, the lack of secondary retouch on the greatest percentage of lithics tend to indicate that the site was probably utilized as a lithic procurement site, or possibly a hunting party campsite.

Both areas had natural occurring outcrops of cobbles from the Ogallala formation. The greatest majority of lithic debris had cortex present, and most of the debris was produced by hard hammer percussion, suggesting that the area was either a lithic procurement area (quarry) or a lithic workshop.

The total absence of manos, metates and other ground stone was very noticable, suggesting that neither site was utilized as a food processing site, lending further evidence in favor of a lithic procurement site or a hunting party campsite. There also appears to be a definite relationship between the localization of quantities of burned rock and ceramic occupation in the middle Pecos region as pointed out by Henderson (1976:39). Neither site contained any burned rock mounds, the only burned rock was found in association with small hearths. Illustrating again that the site probably was not utilized as a food processing location.

Other sites of the Querecho Phase of the Mogollon (i.e., sites found in the Mescalero Sand area) yielded grinding implements and ceramics indicating food preparation at the sites. These were seasonal gathering sites for acorns, yucca, prickly pear, and to some degree mesquite (Beckett 1976: 100). Exactly what other species of plants and animals were favored and the method of preparation by these people is presently only speculation, but they probably utilized many of the same food sources as presented in the Mescalero model.

The site function and sex roles can be tentatively identified by the lithic debris (positive data) and the lack of certain cultural items (negative data). If the site had been utilized as a hunting camp base, it should have produced a reasonable amount of lithic debitage associated with pressure flaking, as the points and other cutting implements were resharpened, or fashioned. The large amount of debris from hard hammer percussion and the small percentage of artifacts and flakes with secondary retouch suggests that

these areas were quarry areas. The lack of ground stone implements and pottery on a Formative Period site suggests that there is a good possibility that the site was the result of a male originated activity.

In Conclusion:

- 1) The Yeso Hills Site and the Dillahunty Site were utilized as quarry sites.
- 2) The remnants of the Ogallala Formation on these areas provides one of the few sources areas for lithic materials.
- 3) The lithic debris on both sites was essentially the same as that found in the Mescalero Sands, suggesting a similiar time period and perhaps culture.
- 4) The probable reason for the limited usage of the sites is the size and quantity of the raw source material available at the sites.
- 5) A hearth in the Yeso Hills Site produced a date of A.D. 1025 $\pm$ 70, adding support for Corley's Querecho Phase date and the authors cross-dating of the lithics based on the sites found in the Mescalero Sands that contained both ceramics and lithics.
- 6) Most of the lithic debris was produced by hard hammer percussion.
- 7) The total absence of manos, metates and other ground stone along with the absence of ceramics suggested that the site was not utilized as food processing site.
- 8) The local flora and fauna was probably exploited in much of same manner by both the individuals who utilized the quarry sites and the Mescalero Apaches as represented by our model.

- 9) The total lack of ground stone and ceramics on a Formative Period site suggests that there is a good possibility that the site was the result of a male originated activity.

APPENDIX A

A Brief Overview of the Prehistory of Southeastern New Mexico

Archaeologically speaking, southeastern New Mexico has been one of the least understood parts of the state, possibly because there are few spectacular ruins or monuments to attract attention. Most of the work has been done on the early Big Game Hunters who inhabited this region from about 11,500 Before Present (B.P.) to the advent of the Altithermal about 6,000 B.P. (Wendorf 1961: 123).

The archaeological summary below is organized on the basis of the stage system which is generally accepted by American archaeologists (see Willey and Phillips 1958)

Lithic Stage

The Lithic Stage dates from late glacial and early postglacial times. It is predominately a hunting stage exploiting large migratory herbivores, most of which are now extinct. It is also likely that these hunters utilized and exploited the vegetal resources available during their quest for these herbivores.

These hunters probably were organized into highly mobile nomadic bands, each consisting of several related nuclear families. This structure is common among contemporary hunters and gatherers.

We would say then, for purposes of definition, that the Lithic is pre-eminently a hunting stage, though other economic patterns were certainly present whose local dominance, under certain conditions is not precluded

A small-scale kinship type of organization is postulated, but within this generalization, great variability and a high degree of specialization must be allowed for. The data do not support the view that because Lithic cultures are relatively simple they are also uniform (Willey and Phillips 1958:41).

Llano Complex

The earliest human occupation in southeastern New Mexico seems to have been by the hunters of the Llano Complex, which includes the Clovis and Folsom traditions. The Llano Complex concept was proposed by E. H. Sellards (1952). The name is derived from the "Llano Estacado", a plain in eastern New Mexico and west Texas where many sites of this complex are found. Multiple-component sites (those with artifacts from different cultural levels and temporal horizons) are rare in the archaeological record. Southeastern New Mexico has one of the type sites, Blackwater Draw.

Blackwater Draw has provided a basic sequence and dating for many of the artifacts found in the Lithic Stage. The earliest culture in the Llano Complex is the Clovis Tradition. There are three (3) radio-carbon dates for the Clovis occupation at Blackwater Draw. They range from $11,040 \pm 500$ to $11,630 \pm 400$ B.P. All of these dates fall within the accepted 9,000 to 9,800 B.C. range that has been suggested for the Clovis Tradition.

The tool assemblage for the Clovis Tradition is adapted primarily to big game hunting. Their projectile points and butchering tools have been found in situ with mammoth and extinct forms of bison. Clovis points are generally fluted, although many specimens have such short flutes that they appear to be basally thinned. The tool assemblage has best been described by Agogino in his 1968 report to the National Geographic Society.

With the exception of points, most of the other lithic artifacts from the Llano horizon were unifacial in style.

The majority of scrapers were side-scrapers, although dual-purpose scrapers were common. These include spoke-shave scrapers, graver scrapers, or combination side and end scrapers. Scrapers made as single-purpose tools were generally constructed from prepared blades, broken into several segments, each segment made into individual end scrapers. Breakage, which was common toward the dorsal section of these end scrapers, suggests that they were hafted on wooden or bone handles. Roughly two-thirds of all knives are unifacial knives, and it is frequently difficult to distinguish some unifacial knives from side scrapers; in some instances they probably served both functions. Bifaced tools show little edge retouch, and all flaking, regardless of the artifact, seems to be pressure flaked in manufacture (Agogino 1968:4).

The Folsom Tradition follows the Clovis in the Llano Complex.

Folsom dates between 9,000 and 8,000 B.C. (Haynes and Agogino 1966).

The Folsom economy is based on the hunting of large herbivores, especially an extinct species of bison.

The material culture inventory includes diagnostic fluted points and scrapers, including end-scrapers, thumbnail scrapers, turtleback scrapers and spokeshaves (a small concave scraper). In addition, leaf-shaped knives, core choppers and bone tools such as awls and needles are also part of the Folsom assemblage.

These tools, along with the bison kill sites where these artifacts are found, suggest a native population highly dependent upon the hunting of big game.

Plano Complex

The Plano Complex is the last of the so called Early Man horizons. These cultures were once collectively called the Portales Horizon at the Blackwater Draw locality. The name Plano was suggested by Dr. James Hester in 1962 when he felt that the artifacts within the Portales horizon

might be a series of separate cultures. This hypothesis has been substantiated by Agogino. While the Plano cultures at the Blackwater Draw site have not been fully defined, the cultures just underlying the Archaic from the most recent to the oldest are Frederick or Angostura, dated at 7,000 years old; Cody, roughly 8,000 years old; and the oldest of the post-Folsom cultures, Agate Basin at roughly 9,500 years old (Agogino 1968:6).

Agate Basin -- 7,500 B.C.

The type site was excavated by Frank H. H. Roberts, Jr. (1943). Little is known about the people who made the distinctive projectile points known as Agate Basin points. It is known that they hunted bison, as many were present in the original excavation. Wormington describes the points as: "long and slender with parallel or slightly convex sides. They have basal grinding.... the bases are straight or convex; the flaking is always of the horizontal type; there is a finer marginal retouch, and the basal thinning is usually absent." (Wormington 1964: 141)

Cody -- 6,000 B.C.

Although the type site is located in Wyoming, many of the artifact types are found in southeastern New Mexico.

No detailed description of the other artifacts which go to make up the Cody Complex has been published, but they include scrapers, knives, engraving tools, perforators, choppers, pounders, and rubbing stones. There is one distinctive artifact which can serve as a diagnostic for the complex even though it is unaccompanied by the characteristic projectile points. This is a form of knife which has a transverse blade and is usually stemmed on one side. It has been informally called a Cody knife. (Wormington 1964: 128).

No evidence of shelters or dwellings has been found in these early horizons. The Horner site has provided some information as to occupation areas and their utilization.

The site (Horner Site) has not yielded evidence of dwellings nor of prepared hearths. There are, however, some burned areas where fires had been built. Of particular interest is the finding of shallow lineally arranged pits dug into the gravel of the terrace. They are from twelve to thirty inches across at the top, narrower at the bottom, and about a foot deep. Perhaps they were used for storage (Wormington 1964:128).

Angostura - - 5,000 B.C.

The type site is the Ray Long Site, south of Hot Springs, South Dakota. No bones were found in association with the site. The site was destroyed by the filling of the Angostura Reservoir. Wheeler (1954) suggested the name Angostura for the points. Wormington describes them:

These are long, slender, and lanceolate, and taper to a narrow base which may be straight or concave. The points are quite thin. The flaking is fine, and the flake scars, which are parallel, are usually directed obliquely across the face of the blade. (Wormington: 1964:140).

These Plano big-game hunters were replaced in southeastern New Mexico by an Archaic tradition at the start of the Altithermal, which marked the advent of a drier climate.

Archaic Stage

The Archaic Stage is a phenomenon of the post-glacial period. Archaic cultures are generally characterized by the hunting of modern species of animals and by a heavy reliance on wild plant foods. Grinding stones and a number of stone tools which seem to have been used for processing vegetable foods came into common usage.

This is probably the least understood period for the region. Professionally surveyed or excavated Archaic sites are almost nonexistent, the exceptions being Rattlesnake Draw and Jelinek's site P5, a late Archaic Site. Jelinek states that the artifacts on a site on the Llano Estacado and the surface collection made by Jim Warnica, south of Ft. Sumner, New Mexico, would tend to indicate a possibility of native San Jose points for the area (Jelinek 1967:141). Excavations by Irwin-Williams northwest of Albuquerque in the late 1960's indicate that the San Jose materials should have a more northwestern distribution (Irwin-Williams 1970: personal communication).

Calvin Smith has twice reported on a distinctive point type known as the "Maljamar Point" (Smith 1972:33-35; 1974:20-25). He assigns these to the Hueco Phase, a late variant of the Cochise Culture. An example of this point type was recorded by a New Mexico State University survey near Artesia, New Mexico, in January 1974. It would seem to be a localized distribution and no doubt indicates a late Archaic phase. There is some question as to whether the Cochise Culture underlies the ceramic periods in southeastern New Mexico.

Lehmer (1948:72) linked the Jornada Branch of the Mogollon to the Cochise Culture. In doing so, he referred to the late Archaic of the Jornada area as the Hueco Phase; a name given originally by E. B. Sayles (1935) and called "Hueco Cave Dweller", a term used to distinguish it from the Big Bend and Pecos River Cave Dwellers and all Archaic phases falling into the Trans-Pecos region. Later investigations of the Hueco Phase by C. B. Cosgrove (1947) and Donald J. Lehmer (1948)

have supported Sayles' original Hueco designation. Lehmer cited Sayles' "Hueco Cave Dweller" but adds that numerous non-ceramic open sites also appear to be part of the complex (Lehmer 1948:71).

The term "Hueco" is also an unfortunate and cumbersome name as it has been at times misplaced on some Archaic materials found west of the San Andres Mountains which are not necessarily the same types of artifacts found east and south of the San Andres Range, as the name implies. The San Andres Range seems to provide a natural barrier and boundary for the inhabitants of the Jornada area.

The excavations at Fresnal Shelter, east of Alamogordo, New Mexico, have provided a preliminary basis for comparison with the site material from LA 5529 located northwest of Las Cruces, New Mexico (Beckett 1973). These artifacts, along with surface collections from both the east and west sides of the San Andres Mountain Range, indicated that different projectile point types and artifacts were utilized by these inhabitants, but there is some overlap of the two areas on both sides of the mountain range. The Archaic on the west side of the San Andres Range seems to be predominantly that of the Cochise Culture. Almost all of the Bat Cave point types are evident in surface collections. The east side of the San Andres Range seems to be more closely related to southeastern New Mexico and west Texas materials (Irwin-Williams 1972: personal communication). This would, in effect, explain Lehmer's grouping of the Jornada Branch.

Lehmer (1948) divided the Jornada Mogollon into northern and southern sections. The entire northern section falls east of the

San Andres Range and the southern section lies, for the most part, to the west of this north-south mountain chain (see Figure 14).

A two part division should be made for the term, Hueco: (a) the geographical region west of the San Andres which would be equivalent to Lehmer's southern group. This region is predominantly Cochise in origin with typical Chiricahua and San Pedro material occurring in Archaic sites, (b) the geographical region east of the San Andres which would be equivalent to Lehmer's northern group. This material seems to have closer ties with the Archaic material from southeastern New Mexico and west Texas.

Thus, the term "Hueco" should be redefined. The real problem is that some of the sites in which Hueco was defined by Cosgrove and Lehmer are west of the San Andres and the name "Hueco" is taken from the Hueco Basin in Texas, which is in another geographical region, and contains different types of material culture.

In 1960 Jelinek also postulated a Late Archaic Phase termed "Yeso Phase". Later in his 1967 report he states:

After examining a greater number of ceramic site localities in and around the Pecos Valley, and in other areas of the Southwest, I am now less inclined to treat the collections from this site as a particular assemblage. (Jelinek 1967:141)

The Archaic Stage in southeastern New Mexico appears to be an indigenous development and not part of the San Jose (Oshara Tradition) or Hueco (Cochise Culture). A systematic study needs to be done to clarify the Archaic Tradition in southeastern New Mexico.



FIGURE 14: JORNADA AREA PROPOSED BY LEHMER
(LEHMER 1948:10)

- ① LA CUEVA (excavated by Lehmer)
- ② CHAVEZ CAVE (excavated by Cosgrove)

Formative Stage

In southeastern New Mexico, the Formative population seems to have developed out of the local Archaic population. This shift to a Formative economy did not happen at the same time in all parts of southeastern New Mexico.

In most areas of the Southwest, the Formative Stage is characterized by the heavy dependence on domesticated plants (and sometimes animals), the presence of structures and the manufacture of pottery. This appears to hold true for sites found west of the Pecos River in southeastern New Mexico. The Bloom Mound site approximately 14 miles west-southwest of Roswell has produced charred corn (Kelley 1966:594).

The Formative Stage in the extreme southeastern portion of New Mexico exhibits many Southwestern traits along with influence from the Plains area. The inhabitants did not utilize agriculture as such but rely on the gathering of natural foodstuffs and the hunting of the local fauna (i.e., Bison, deer, antelope and rabbit).

Recent investigations in the Mescalero Sands area (Beckett 1975; 1976) and in portions of the shinnery belt to the south indicates that these areas were being exploited for the acorns that the shinnery oak produce. The large number of campsites with no permanent structures along with the large number of grinding implements indicate a seasonal exploitation of the plant community.

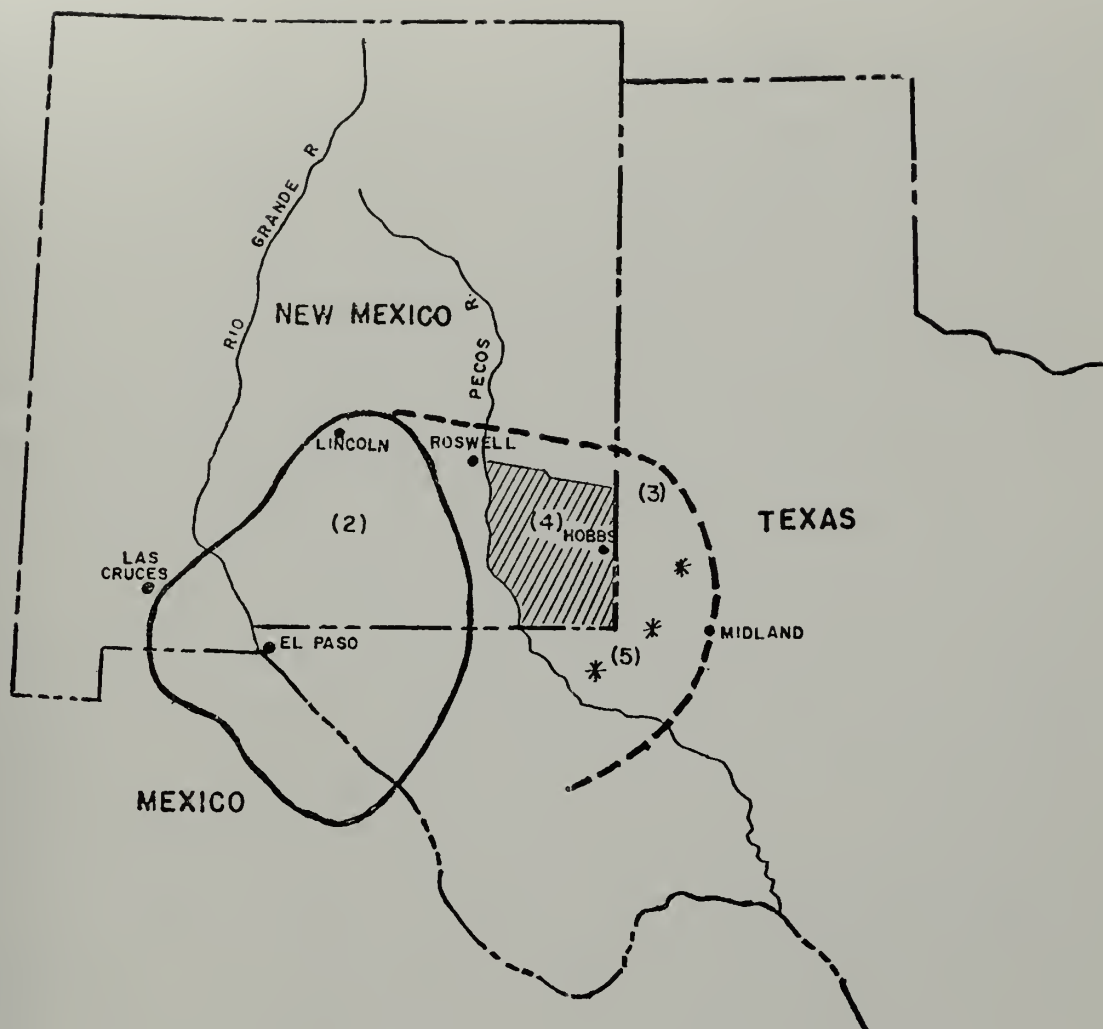
Shinnery oak has been recorded in the area for the last 100 years on the Township Plat Maps (York and Dick-Peddle, 1969:164). In addition,

the pollen profile taken in Wolf Ranch Canyon west of Roswell, Chaves County, New Mexico, by F. E. Green (see Wendorf 1961:67) indicates that shinnery oak (Quercus harvardii) is continuously in the pollen profile in a relatively stable manner to a depth of 14 feet. A radiocarbon date of 2850 ± 100 B.P. was assigned to the 9.5 foot level (Wendorf 1961:65). Thus, at least part of the present plant community was present at a relatively early date.

The sites found east of the Pecos River with pottery and structures, have not produced corn or corn pollen. The Merchant Site, excavated by the Lea County Archaeological Society, has produced charred acorns (Leslie 1965:28). The Salt Cedar Site, excavated by Collins, has Quercus in the pollen record for the site (Collins 1968:45). Both sites had a number of milling stones in association with the structures. It is assumed that if they were not processing corn, they must be processing wild foodstuffs that were found nearby. This would explain the great number of seasonal camp sites located in the shinnery belt.

In this report, the Formative Stage will be broken down into the phases proposed by Corley in his Proposed Eastern Extension of the Jornada Branch of the Mogollon (Corley 1965) (see Figure 15). Corley's proposal is based on Lehmer's Jornada Branch of the Mogollon (Lehmer 1948) which deals with material found further to the east. Although another professional archaeologist, Jelinek, had proposed a sequence for the Middle Pecos Valley, it does not seem to be the one best suited to the Roswell area.

Anasazi influence does not seem to have reached farther south than



- 2 Approximate area described by Lehmer showing known extent of Jornada Branch.
- 3 Dashed line shows our proposal to extend the Jornada Branch to the east, at least 150 miles.
- 4 Hatched area shows corners of New Mexico in which site survey was conducted.
- 5 Stars indicates sites containing Ochoa sherds outside area surveyed.

FIGURE 15: PROPOSED EASTERN EXTENSION OF THE JORNADA
BRANCH OF THE MOGOLLON CULTURE
TAKEN FROM CORLEY 1965: 33.

Roswell, if that far. Jelinek's surveys in the Middle Pecos Valley seem to contain materials from both the Anasazi and Mogollon areas, which would seem to suggest that the Middle Pecos area was a fringe area between the two basic cultures. This is further borne out of Honea's observations on pottery from the Llano Estacado. Intrusive pottery seems to be of two traditions: in the southern part of the Llano, it appears to be predominantly of Eastern Mogollon derivation; while to the north it is Eastern Anasazi (Eastern Pueblo) (Honea 1973).

Thus, Corley's proposed extension seems correct geographically speaking. Whether the area proposed by Lehmer and extended by Corley is Mogollon in origin or is an indigeneous development within southern New Mexico still needs to be clarified. Regardless, the phases and their associated pottery will still be valid.

The Formative Stage in southeast New Mexico, (Corley's Eastern Extension of the Jornada Branch of the Mogollon), is sub-divided into three phases: Querecho Phase, A. D. 950-1100; Maljamar Phase, A.D. 1100-1300; and the Ochoa Phase, A. D. 1300-1450.

Querecho Phase A. D. 950-1100

The Querecho Phase appears to be contemporaneous with Lehmer's Mesilla and Capitan Phases. Architecture: pithouse. Ceramics: smooth brown and a corrugated pottery. Intrusive Ceramics: El Paso Brown, Jornada Brown, Jornada Red/Brown (Bichrome), Three Rivers Red-on-Terracotta (boldline) and Chupadero Black-on-White.

Maljamar Phase A. D. 1100-1300

The Maljamar Phase is contemporaneous with Lehmer's Dona Ana and

Three Rivers Phases. Architecture: Lehmer states that "Many of the sites yielding this ceramic complex show traces of developed surface pueblos,"¹¹ but Jennings's work seems to indicate that pithouses also persisted into this period (Jennings 1940), at least on the eastern periphery (Lehmer 1948:85-86). Ceramics: on pit room sites, a smooth brown and a brown corrugated pottery belonged to the pitrooms, while a dark brown indented corrugated pottery belonged to the surface room sites (Corley 1965:31). Intrusive Ceramics: El Paso Brown, El Paso Polychrome, Mimbres Black-on-White, Playas Red, Playas Red Incised, Three Rivers Red-on-Terracotta (fine-lined and bold-lined) and Chupadero Black-on-White.

Ochoa Phase A. D. 1300-1450

The Ochoa Phase appears to be contemporaneous with Lehmer's El Paso and San Andres Phases. Architecture: surface houses. Ceramics: dark brown indented corrugated pottery. Intrusive Ceramics: El Paso Polychrome, Three Rivers Red-on-Terracotta (fine-line), Gila Polychrome, Ramos Polychrome, Pecos Glaze I Red and Yellow, Lincoln Black-on-Red.

Historical Period A. D. 1582-?.

This period covers the period after the first Spanish expeditions traversed the southeastern part of New Mexico, the Espejo Expedition (1582-1583), did not encounter any Indians (they did see signs of Indians) during their travel through the region in the month of August, 1582 (Schroeder 1974:147). Pecos Pueblo and Gran Quivira were probably the closest inhabited settlements to the region.

Thus, there is a break or hiatus in the archaeological and historical record in the occupation of the area between A.D. 1450 and October, 1590, when the Castano de Sosa Expedition encountered a group of Indians probably just north of the present New Mexico/Texas border.

On the 31st of the month, the party encountered a band of Indians who carried their goods loaded on dogs, a thing very marvelous in the eyes of the Spaniards... During the next few days many more Indians were met. These proved, for the most part, to be by no means friendly. (Hull 1916:314)

These groups encountered by the Castano de Sosa Expedition and whose signs were noted by Espejo might have been the forerunners of the Apache Indians who for the next several hundred years were to play havoc with the settled eastern Pueblos, Spanish and later Anglo-American penetrations into the area.

It is known that from 1590 to the time of the Pueblo rebellion of 1680, there was considerable Apache pressure placed on the eastern Pueblo Indians and the Spaniards. Ayeta in 1679 and 1672 implied that Apache pressure and attacks were coming from the southeast and that in 1672 six pueblos were depopulated.

These pueblos were abandoned a few years prior to the Pueblo Rebellion of 1680, due to the pressures of Apaches from the southeast. It is apparent that the Apaches from the Sierra Blanca expanded their raiding range from the south after the 1650's. By the 1670's they had forced the pueblo people from their homes on the east side of the Manzano Mountains, almost as far north as Albuquerque. (Schroeder 1974:483)

Of the various Apache groups that occupied the southwest, two figure more prominently than any other group in southeastern New Mexico. These are the Mescaleros and the Llaneros, who were best described by Lieutenant Colonel Don Antonio Cordero in his notes about the Apache Nation composed in 1796. The following is Cordero's description of Mescaleros

and the Llaneros (Matson and Schroeder 1957:354-355).

Mescaleros

This group dwells, generally speaking, in the mountain ranges near the Pecos River, extending northwards on both banks as far as the Comanche. It uses this locality particularly in the proper season for the buffalo hunt, on which occasions it joins with the plains group which is its neighbor. It proceeds in a like fashion when it undertakes offensive operations against the Spanish establishments, inviting the Faraones to take part in its enterprises. In general it starts out through the Mapimi depression, whether it is casting its glances towards the province of New Vizcaya, or whether it resolves to invade that of Coahuila. They like firearms of which they have some; but they do not on this account give up weapons which are proper and peculiar to them. The number of families which composes this group is small, since they have suffered much from the Comanches, their most bitter enemies, and due to some diminution of which the Spaniards caused them in their old disputes. On the north their boundary is the Comanche country; on the west the Faraon tribe; on the east the Llaneros, and on the south frontier.

Llaneros

These Indians occupy the plains and sandy places situated between the Pecos River, which they call Tjunchi, and the Colorado which they call Tjulchide. It is a group of some strength, and is divided into three parts, that is today: Natajes, Lipiyanes and Llaneros. They check the Comanches in the continual fights and bloody actions which frequently occur, especially in the season of the buffalo hunts. They attack, although infrequently, the Spanish establishments, uniting themselves for this purpose with the Mescalero and Faraon Apaches, with whom they have a close friendship and alliance, they border to the north on the Comanches; on the west with the Mescaleros; and on the east with Lipanes, on the south with the line of the Spanish presidios.

By late Fall of 1862, over 500 Apaches were in custody at Fort Sumner. These Apaches were soon joined at the Bosque Redondo Reservation by Navajós who Col. Carson had rounded up in northwestern New Mexico. The object was to make sedentary farmers out of these nomads. The other reason was to provide a buffer zone

(the Apaches and Comanches were old enemies), thus relieving Comanche pressure on eastern New Mexico.

A series of crop failures which produced famine on the Reservation was such that: "...all of the Mescaleros, but nine who were sick, left Bosque Redondo as a group on the night of November 3, 1865" (Schroeder 1974:62-563). They returned to their old ways and resumed raiding. In may 1873, a reservation was set up for them in the Sacramento and White mountains. Although the boundaries have changed somewhat, the Mescaleros have been on the reservation since then, the only exceptions being in the mid-1870's when a few renegades were still making sporadic raids.

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BORROWER

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